

Scaling-up Egg Production: Management, Markets, Regulation, and Finances

Credit: *Maple Wind Farm*



Acknowledgments

This project was a collaboration between University of Vermont Extension and The Intervale Center made possible through funding from the Vermont Agency of Agriculture Working Lands Enterprise Initiative. Many people contributed information and time to the completion of this report. Special thanks to Maggie Donin, John Smith, Sona Desai, Annette Higby, Pat Sagui, Tom Gilbert, and all the farmers and retailers who contributed time and information.

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Citation: Cannella, M.P and Smith S. 2015. *Scaling up egg production: management, markets, regulation and finances*. University of Vermont.

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Project Summary

This project was developed to assess the potential viability of increased pasture-based egg production in Vermont. The project was designed to explore the viability of three specific enterprises: a 1,000 layer enterprise, a 3,000 layer enterprise and a 3,000 layer enterprise that would also aggregate eggs from other 3,000 layer farms. We researched current production practices being used by regional pasture-based egg farmers, conducted a market assessment of local and regional markets, reviewed the legal aspects of each enterprise and developed financial models.

Our report includes the following:

- Best Management Practices recommendations based on current producers experience and industry recommendations.
- Market analysis and recommendations for local and regional markets.
- Legal analysis of egg regulations and potential structures for an aggregation entity.
- Financial analysis of budgets and start-up costs for 1,000 and 3,000 layer enterprises.
- Resources for developing or expanding a layer enterprise.

Conclusions

This research generated a number of general conclusions. Specific recommendations can be found in the individual sections of the report.

- Production practices vary widely and can have a profound effect on the profitability of a layer enterprise.
- Local and regional markets have demand for both organic and non-organic, pasture based eggs. These markets have seasonal fluctuations in both supply and demand and consistency of production is essential for producers hoping to access them.
- Regulations favor farms that stay below the 3,000 bird limit. There are Federal and State regulations that producers should understand and abide by.
- Both 1,000 and 3,000 bird enterprises have the potential to be profitable but producers should develop budgets specific for their farm before developing or expanding a layer enterprise.
- An aggregator model enterprise could yield potential benefits through access to markets and reduced processing and distribution expenses. This model warrants thorough research before a producers or group of producers were to expand to this level.

Best Management Practices

Six different farm owners and/or managers were interviewed to compile the best management practices. The owners operate both within Vermont and in surrounding states. An interview was also done with Vital Farms, an egg aggregator based in Texas.

The goal was to collect information from the owners and managers on birds, feed regimen, feed systems, water systems, housing, pasture systems, egg handling and processing, labor, health, sales and marketing, seasonality, record keeping, and profitability.

Birds:

The most economical and simplest option is to buy 17-week-old started pullets. Hybrid breeds such as ISA Brown, Brown Hy-Lines, and Bovan's Brown are capable of producing over 300 eggs in their first year of production. Traditional breeds such as New Hampshire Reds and Barred Rocks can also be raised, but they are not recommended for commercial production as they lay far fewer eggs annually. Started pullets can be purchased directly from pullet rearers such as Moyers, or from dealers, such as Burr Farms. Most of these birds have trimmed beaks but pullet raisers are starting to raise some pullets with intact beaks, specifically for those raising hens on pasture. The typical price for started pullets ranges from \$6.50 to \$8.25 including delivery.



Raising pullets is also an option but it is usually more expensive to do so. The advantages of raising pullets include control of the rearing process, earlier transition to pasture and reduced shock of transportation from the pullet house to the farm. The downsides to raising chicks include higher cost, higher risk of loss and a higher level of care required for the chicks.

Feed:

Along with pullets and labor, feed represents one of the most significant expenses in pastured egg production. Small changes in feed consumption or price can have significant impacts on the net income of an egg enterprise. Poultry eat only for their energy needs, not for their protein or mineral needs. Breed management guides (available online from breeders) outline the specific needs of each breed (hatcheries or pullet dealers should be able to share the breed being purchased). Generally laying hens need about 300 calories, 16-19 grams of protein, and 3.5-4 grams of calcium per day for large egg production. This varies based on age and environment. In large laying houses with a controlled atmosphere and low activity level the typical hen eats about 0.25 pounds/day. Hens that live in colder conditions (for every degree Celsius change in temperature, feed consumption will change about 1 gram per hen per day) or are more active will eat more to meet energy needs. Unless the protein content of the feed is decreased, egg size will increase and productivity will decrease (egg size is primarily a function of protein consumption).

Optimum production and efficiency is achieved through phase feeding. As birds get older they need less protein, less energy, less phosphorus and more calcium. Large commercial producers often use 4 different feeds throughout the laying cycle, a practice known as phase feeding. Most pastured egg producers don't phase feed since it requires more management – producers must segregate flocks, have multiple feed storage containers, track which phase each flock is in and ensure that all feed is consumed before it goes bad.

Most pastured producers offer free choice feed to their hens, but some restrict feed when egg size is excessive. The goal of restricted feeding is to limit energy without limiting crucial nutrients. Amino acids, vitamins and mineral concentrations are more critical with restricted feeding than with full feeding. Restricted feeding should not be employed until hens are laying primarily large eggs. It is important to note that there is conflicting information about restricting feed. The Certified Humane organizations do not recommend restricting feed from an animal welfare point of view but the nutrition research encourages it from a production and economic efficiency standpoint.

Most pastured producers provide free-choice feed in PVC troughs or round range feeders. Trough schooners can be made by mounting PVC troughs on lumber or other pipes so that a group of feeders can be moved forward at one time. If the birds are allowed to run out of feed between feedings, 4 inches of linear space (2 inches of circular space) should be provided per bird to ensure that all birds have access to feed. The lip of the feeder should be the same height as the top of the hen's back in order to reduce waste. Feed should not be ground too finely. A medium grind is ideal when mash is used. The use of

pelleted feed can help reduce waste and ensure the hens are consuming the complete ration. Appropriately-sized granite grit should be available free choice, especially when whole grains or pellets are fed and when the birds have access to forage. Grit aids in digestion and will improve feed efficiency and laying production. Oyster shell is not a sufficient substitute for grit but can be offered freely as a supplemental calcium source, especially for older hens that need more calcium.

Food Waste Diversion:

Purchased feed inputs represent a significant cost to egg producers. Imported feed grain is a production attribute that may impact the marketing cache of locally produced eggs to consumers. Local resources exist that may provide more economically and energy efficient feedstuffs. Among these, discarded food from residents, restaurants, grocery stores, schools, and other businesses and institutions are an abundant material locally available to producers.

Several egg producers in Vermont have been using food scraps as a feed for over a decade with good anecdotal results, however no data exists to establish the economic productivity, nutritional qualities (for hens and humans) and safety of this practice. While a clear opportunity for sourcing some portion of hen food locally from non-purchased grain sources is available, this practice needs further assessment to better understand its costs and benefits.

A switch to using food scraps as feed in a laying operation requires changes in the production system. Producers looking to implement this practice will benefit from further analysis of its implications and opportunities. Prevailing thinking suggests this practice is most effectively implemented in conjunction with a composting system despite the absence of documented best practices. Key considerations include: infrastructure to handle and feed food scraps, food scrap ration rates, a composting system to manage left over food scraps, potential for increase in pest pressure, potential pathogen exposure and hen health, increased labor costs, reduced feed costs, egg quality and animal health benefits of year round access to ‘compost pastures.’ Active compost piles do not freeze, and the biological activity can provide winter hens with benefits similar to pastured layers. See Appendix G “Feeding Food Scraps to Laying Hens” for more information.

Water:

Water is the most essential nutrient for laying. Generally chickens will consume two times as much water as feed and a lack of water can cause an almost immediate drop in egg production. Providing constant access to water can be especially challenging during cold winters. Automatic water systems that operate on pressure regulators or float valves can be used to reduce labor and ensure hens have access to water at all times. In the summer, hoses can be connected to float valves and used with bell waterers, troughs or open pans. Large tanks (such as 55 gallon drums or sap tanks) can be used to feed a variety of waterer types when water hookups are not available. Winter watering solutions include open pans or troughs which are filled manually and can be heated if desired.

Another option is larger tanks with heater or circulating pumps that feed nipples. Its efficacy is debated but some producers regularly add apple cider vinegar to the water (typically at a rate of 1 Tbsp/gallon) in order to boost hen health. This can be done manually or with a medicator.

Housing:

Most producers use a high tunnel or solar barn to house their laying hens in the winter. If a high tunnel is used, shade cloth or opaque plastic should be used to reduce light intensity (30% light transmission is ideal). Intense lighting can over stimulate laying hens and lead to aggressive behavior. Supplemental lighting is recommended to maintain production. Find more details on this in “Production/Seasonality” section of the best management practices. A minimum of 1.5-2 sq. ft. of space is typical per bird in fixed winter housing. Maintaining a dry living environment is important especially in the cold winters. Bedding materials include wood shavings, mulch hay, straw and dried leaves. Wood shavings are the most absorbent but are more expensive and are not digestible. Mulch hay, while not as absorbent, generally is cheaper and also provides something for hens to pick at. Experience in Vermont has shown that passive solar retention and the composting action of the bedding provides measurable heat that significantly reduces the need for supplemental heat. Usually access to the outside is provided with winter housing so that birds are able to get outside when the weather allows.

Summer housing can be provided in egg mobiles, skiddable houses or the birds can be housed in the same fixed housing year-round with the pasture rotated around them. Mobile houses can provide access to more pasture, enable integration between hens and other livestock (grazing cows), and spread fertility over a larger land base (for hay/pasture and/or vegetable production) but they tend to be more labor intensive to manage and they can increase stress on the birds. Options for mobile houses include scissor truss structures built on skids and egg mobiles built on hay wagons, old camper bases or hoop houses. Usually 0.5-1 sq. ft. per bird is provided in mobile houses. Fixed year-round housing tends to be easier to manage and can allow for more permanent infrastructure (feeding, watering, egg-collecting systems) but requires bedding year-round (for the house itself and sometimes for the area near the house) and limits the pasture available for the hens to explore.

Roosts should be provided in all housing types. Roosts provide a place for birds to sleep at night also a place for weaker birds to escape from more aggressive birds.

Pasture System:

A minimum of 2.5 acres (108,000 sq ft) total pasture area should be provided for every 1,000 hens. This should be divided into at least 8 sections providing at least 13 sq. ft. of pasture per bird in each paddock. Many producers provide much more pasture than this. Paddocks should be moved at least once a week to provide the hens with new pasture. Pasture requires at least 1 month of recovery before layers return again. Houses can be moved more frequently to better distribute the hens' impact on the pasture. Electric poultry netting is most commonly used to keep birds in their paddock and to discourage

ground predators. The netting can be powered by a solar charger, battery or connected to high tensile fence. Livestock guard dogs can be purchased and trained to live with the hens when electric fencing is not sufficient to protect against ground or aerial predators. A variety of breeds are used.

Egg Handling/Processing:

A nest box should be provided for every 5-10 birds (the literature says 1:5 but many producers follow a 1:10 ratio). Hens are looking for a quiet dark place to lay their eggs. Curtains over the nest boxes can encourage nest box use, discourage hens from spending time in the boxes (keeping them cleaner) and can reduce peck-outs. Eggs are collected at least once a day with plastic buckets, wire baskets or plastic egg flats. Ideal storage conditions for unwashed eggs are 60°F and 70% Relative Humidity (RH). Keeping nest boxes and the area around and below them clean is the best way to have clean eggs. Dirty eggs can be washed by hand or with an egg-washing machine such as one made by Gibson Ridge Farms or by National Poultry Equipment (also known as AquaMagic). The time spent washing eggs varies significantly depending on the washing method and condition of the eggs. Eggs are porous and soaking eggs is not recommended. Soaking for as little as 1-3 minutes can result in bacterial transmission. Wetting eggs before washing them does help loosen debris. Water for washing eggs should be at least 90°F and should be at least 20°F warmer than the eggs themselves to avoid drawing dirty water into the eggs. Sanitizers can be used in the washing process but most producers simply use hot water to wash their eggs. Washed eggs should be kept at 45°F or less with 70-85 % RH. Eggs will keep for 3 months in these conditions and for about 5 weeks when kept in a standard refrigerator. See more details about food safety regulations in the “Legal Review” section.

Labor:

Labor is a significant and highly variable expense in pastured egg enterprises. Labor requirements vary depending on production and washing systems. Weekly labor requirements for different tasks for a flock of 1,000 hens include: washing (4-14 person hours/week), daily chores (3-10 hours/week) and sales/deliveries (1.5-3 hours/week).

Health:

Nest boxes and houses should be disinfected periodically with a pine-tar based disinfectant to protect against mites. Diatomaceous Earth (DE) can be sprinkled in boxes and around the houses. Dust baths should be provided for birds. Dust bathing helps keep feathers in good condition to prevent injury and help maintain body temperature. Wood ash and DE can be mixed together in tubs to create dust baths to guard against mites and lice. Care should be taken to ensure that ammonia levels do not exceed 10-25 ppm. Ammonia levels above 10 ppm can reduce body weight and feed efficiency. Levels above 25 ppm can damage the birds respiratory system. The human nose can't detect ammonia at these levels, so the levels are too high if you can smell it. Proper ventilation and fresh bedding are keys to controlling ammonia levels.

Packaging:

Most pastured eggs are sold unsized and ungraded. Packaging costs are typically 13-30 cents per carton and 5-8 cents per label. Many producers purchase their cartons from www.eggcartons.com but egg cartons (about 13 cents each) are also available from Packaging Corporation of America.

Production/Seasonality:

Maintaining productivity through the winter is a significant challenge with pastured egg production in the northeast. Laying hens need 14-16 hours of daylight to maintain egg production. In Vermont, there are only 14+ hours of daylight from late April to late August. Supplemental light should be utilized from late August to the end of April in order to maintain egg production. Adding light in fixed houses is relatively easy with simple timers but can be challenging to add in mobile pasture houses. Even with supplemental lighting most pastured egg producers still experience a drop in production during the winter. Summer lay rates range from 70-85% while winter rates may drop to 50-70%. Flocks of different ages should be kept to maintain production. Different flocks should be segregated to track productivity and to differentiate them when they need to be culled. Most producers get new flocks in the spring and fall. It usually takes 6-8 weeks for new pullets to start laying large size eggs. Most old layers are culled between 80 and 110 weeks old. Producers should plan an overlap period between the arrival of new pullets and the culling of old layers to allow the new pullets to start laying and to maintain overall production. There are several possible uses for spent hens. Options include: processing and sale as stew hens, processing and sale as raw pet food, sale back to pullet dealers and sales of live birds for eventual consumption or non-commercial husbandry. Several ethnic groups value colored chickens that they can butcher themselves.

Recordkeeping:

Most producers rely on accounting software, primarily Quickbooks, to track inputs (primarily feed, supplement, packaging, and supplement expenses) and outputs (eggs sold). Tracking inputs and outputs by flock is important in order to judge per flock productivity and to know when to cull. Any data tracking system must be easy to use and the information collected should be used for analysis.

Organic Production

The main production factors to address when considering organic production are the acquisition of organic pullets and the purchase of organic feed. Sourcing organic pullets can be more challenging and tend to be more expensive than conventional pullets. Organic grain, even purchased in bulk, can be up to twice as expensive as conventional feed. There may be demand for locally raised, pastured, certified organic eggs but the producer must be careful to calculate their cost of production before determining a price.

Market Analysis and Recommendations

Market Trends

Consumers across the United States are increasingly interested in knowing the story behind their food and how it is being produced. In the case of eggs, consumers are asking for greater transparency and respect for the animals, the environment and the farmers. People want to eat good food and support their local communities. The local, regional and national demand for regionally produced, pasture-raised and organic eggs continues to grow annually.



Price and consumer education remain limiting factors, however, for farmers raising and selling pastured eggs. This challenge is even greater when a producer tries to raise birds both organically and on pasture. Very large scale egg facilities are also tapping into changing consumer preferences and are responding by offering “cage free” and even “organic” at relatively low prices. “Pasture-raised” requires significantly more labor, which is reflected in higher retail prices. Consumers are often surprised at the price difference in “cage free” vs “pastured,” which can run nearly two dollars more per dozen. GMO-free and certified organic eggs are even more expensive due to higher grain costs. Increased consumer education will be necessary to continue growing the demand for eggs produced with environmental, animal and human welfare in mind. The Cornucopia Institute has created a scorecard and rating process to evaluate many factors that go in to producing an egg. Farmers can register with Cornucopia so that consumers can see how their eggs are rated.

Over the years, many Vermont producers at various scales have begun to respond to the growing demand for local, pastured and/or organic eggs. There is also an increasing interest among Vermont buyers and consumers for eggs that are produced by feeding birds a different ration, like a combination of grain and compost scraps. A new Vermont GMO labeling law may also influence production and marketing of eggs.

In general, there is still unmet demand in the market for local and regional eggs. In our research, we found five primary categories of eggs in the Vermont marketplace: conventional, cage-free, organic, pastured and organic & pastured. Although the majority of egg sales through Vermont supermarkets and independent retailers are conventional or cage-free, there is demand for both organic and pastured eggs in retail food cooperatives, health food stores, independently owned grocery stores, CSAs and farmers’ markets.

Challenges

Many of these markets that are seeking pastured and organic eggs are often looking to local farmers to fill this niche. Our research found that pastured eggs are a product that is frequently sourced hyper-locally where the community can truly know the producer. However, buyers at these markets expressed challenges in procuring local and pastured eggs. The two primary challenges are securing a consistent year-round supply and educating consumers due to the lack of regulations for egg labeling. Of the five buyers we spoke with, all of them said they have unmet demand for eggs yet they all face issues with seasonal dips in production. In Vermont, pastured egg producers must change production practices to deal with changing temperature, light, and weather. See “Best Management Practices” for more information on dealing with seasonal changes in production. As one buyer stated, “If the quality of an egg is really high, then consumers will want to come back after a dip in production. If the quality is mediocre, then you will lose customers to other brands that are consistently available year round.” All five buyers said they had the greatest unmet demand for eggs during the winter months.

The other challenge for buyers is the lack of labeling regulation. Egg cartons include many claims like cage-free, hormone and antibiotic-free, GMO free, free range, pasture-

raised and organic. Certified organic is regulated but none of the other claims are regulated. This creates confusion for consumers. Producers and a retailers find it challenging to communicate the story and distinction of their product on the shelves.

Demand

The market continues to grow beyond conventional and cage-free eggs in Vermont but it is difficult to concretely quantify the demand for eggs sold with additional attributes. The demand varies from region to region around the state and from season to season. In general, demand is greatest for producers that are able to provide a consistent, year-round supply at a competitive price point. Smaller-scale producers are better matched for CSAs, farmers markets and small independent retailers. Medium and larger scale producers are better suited to supply larger retailers, food cooperatives and food hubs. The market for local, pastured and GMO-free eggs on a larger scale is tight during the summer months for many of these markets but opens up considerably during the winter months. There is a market for local, certified organic and pastured eggs in these markets, but our research shows that demand drops once the wholesale price exceeds \$4.25 per dozen.

Chain supermarkets are increasingly seeking out local products but they face significant pressure to meet certain price points. There appears to be a potential market for pastured eggs at a \$2.75/dozen wholesale price to chain supermarkets. More research is needed to confirm and grow this demand in the future. Wholesale prices of \$3.25/dozen may be too high to sell through this channel.

Regional demand for pastured and organic eggs also exists through food hubs and natural food retailers in the Northeast. Whole Foods stores across the eastern seaboard are retailing pastured eggs at approximately \$6.99/dozen and organic eggs at \$8.99/dozen. This translates to approximately \$4/dozen and \$5/dozen wholesale price points, respectively. The largest challenge with these regional markets is ensuring a consistent, pastured, year-round supply given the challenging winter conditions in Vermont. In order to be viable, the product would need to be of superior quality and perhaps include other desirable attributes such as diversified diets for birds, soy-free, etc. It may even be necessary to contract with producers in the South to compete effectively with other large-scale pastured egg producers in the Northeast.

It is important that all producers do their own market research before starting a new egg operation or expanding an existing operation. It is important to talk with potential customers and buyers to gauge demand and price.

Legal Review for Laying Hen Businesses

What follows is a summary of the food safety rules and regulations around laying flocks above and below 3,000 hens, as well as a farm/aggregator model. More detailed explanations can be found in Appendix A, Appendix B and Appendix C.

Food safety regulations for three different types of egg producers were examined. The types of operations examined were a producer with fewer than 3,000 laying hens, a producer with fewer than 3,000 laying hens who also aggregates eggs from other producers to sell under their own label, and a producer with more than 3,000 laying hens who also aggregates eggs from other producers to sell under their own label.



There are a number of agencies that regulate egg production and sale on both a state and federal level. The Food and Drug Administration (FDA), USDA Agriculture and Marketing Service (AMS), Food Safety and Inspection Service (FSIS), and the Vermont Agency of Agriculture, Food, and Markets (VAAFAM) all regulate the production, storage, handling, transportation, grading, refrigeration, packaging and sale of shell eggs. Over time, the FDA jurisdiction over shell eggs has become primary, superseding and overtaking AMS and FSIS jurisdiction and authority.

Producer with Fewer than 3,000 hens

A producer with fewer than 3,000 hens is exempt from the FDA's testing rules for Salmonella Enteritidis and from proposed FDA guidance that would severely restrict pastured poultry production. The FDA Guidance on Layers with Outdoor Access requires that producers prevent wild birds and other stray animals from entering pasture access areas. All producers, regardless of size, must comply with refrigeration regulations under the Salmonella Enteritidis rules for both egg storage and transportation. This rule states that within 36 hours of lay, eggs must be held at or below 45°F. The rule does say that an equilibrium step is allowed for eggs to reach room temperature prior to washing or other processing to temper the eggs. Anyone who stores or transports shells eggs must comply. Producers holding and selling eggs at an on-farm retail outlet must refrigerate them, include safe handling instructions on the consumer carton and permit inspection of their retail facility by the FDA.

Producers with fewer than 3,000 hens are also exempt from AMS rules requiring registration and inspection of egg packing facilities. Vermont Agency of Agriculture, Food, and Markets has published rules governing the sale of eggs that require egg cartons to be plainly and conspicuously marked with size and quality grades. The rule prohibits the sale of ungraded or mixed size eggs except to dealers and mandates that grading shall be done by candling. The Vermont Agency of Agriculture, however, has issued additional guidance that allows all producers of "fresh eggs" to label them Grade A. Nothing should be labeled ungraded. They do not have to be candled but must be sold clean and unbroken. See Appendix E for more details on the Vermont Agency of Agriculture rules around selling eggs in Vermont.

Producer and Packer with fewer than 3,000 Hens

A producer with fewer than 3,000 hens who is also a packer will enjoy the same exemptions as noted above. Refrigeration and the VAAFAM guidance regarding the sale of eggs are the primary regulatory requirements.

Aggregation, however, calls in to play another set of rules under the Food Safety Modernization Act. Under the first set of proposed rules issued by FDA in January of 2013 any farm that aggregated raw agricultural commodities would be required to register as a facility, to comply with Good Manufacturing Practices (GMPs) and possibly

have to develop and implement a Hazard Analysis and Risk-Based Control Plan (HARCP) food safety plan.

In response to a torrent of negative comments, FDA issued a supplemental rule in September of 2014 that did a complete about face on the aggregation issue. Under the supplemental rule, any producer with their own farming operation may aggregate, wash, grade, pack and label its own eggs as well as eggs (or any other raw agricultural commodity) produced on another farm without having to register as a food facility, comply with GMPs or develop a HARPC plan.

However, a stand-alone and off-farm egg aggregation facility engaged in packing and holding eggs (washing, grading, packaging) would be subject to facility registration, and would have to comply with Current Good Manufacturing Practices, maintain records of source and purchasers of eggs, and be subject to the Hazard Analysis and Risk Based Preventative Control rules. Likewise any aggregator that processed eggs – cooking, for example – would not be exempt. This is still a proposed rule and it could change. The final rule is expected to be announced in the fall of 2015.

Producer and Packer with More Than 3,000 Hens

A producer and packer with more than 3,000 hens must register with the FDA and comply with their rules around Salmonella Enteritidis (SE). There are two parts to the rule. The first part imposes biosecurity measures, testing, and recordkeeping requirements on farms with flocks of more than 3,000 hens in addition to procurement of SE free pullets, testing of pullet and hen environments, biosecurity, pest control measures, cleaning and disinfecting poultry houses, and significant recordkeeping requirements. There are exemptions to the first part of the rule if all eggs are sold directly to consumers or all eggs are treated with a process or technology that achieves at least a 5-log destruction of SE. In addition, pullets do not count against the 3,000 bird exemption but if the farm has 3,000 or more laying hens, the pullets do still need to be monitored for SE.

The second part of the SE rules imposes the refrigeration requirements mentioned above that flocks of all sizes must comply with. Both parts apply whether the eggs are marketed interstate or intrastate. In addition, if hens have outdoor access, producers must try to prevent wild birds and other stray animals from entering pasture access areas and monitor and control rodents and flies. It is important to note that the outdoor access regulations are just proposed guidelines and the final guidelines have not been published.

Producers and packers of this scale with an on or off farm retail facility must abide by the Public Health Service Act requiring persons engaged in retail distribution of shell eggs to refrigerate eggs at 45°F and to include a safe handling instruction on the consumer carton. They must also permit inspection by the FDA.

Under the USDA Egg Handler Inspection Act, an egg aggregator with more than 3,000 hens would be considered an egg handler. This would require the packer to register with

USDA as an Egg Handler and maintain records of sales for 2 years. Plants packing eggs for the ultimate consumer are inspected every quarter. This Act also requires egg handlers, including producer packers with a flock greater than 3,000 hens, to store and transport shell eggs packed for the ultimate consumer at 45°F. The label must state that refrigeration is required.

Producer packers with flocks in excess of 3,000 birds will have the same exemptions provided under the proposed supplemental FSMA rule allowing them to wash, cool, label and package raw agricultural commodities produced on their farms and on farms owned by others without having to register, comply with GMPs or have a HARPC plan. Again, these rules are part of the proposed FSMA rules and they could change. A final rule is expected in the fall of 2015.

Selling Eggs Regionally

We examined the regulations of selling eggs in neighboring states to explore the feasibility of selling to a regional market. Every state except New Hampshire requires that grading be done by candling. In some states, ungraded eggs may be sold as “ungraded and not sized” or some other designation. See Table 1 for information on exemptions by state. See Appendix B for more specific information by state.

State	Exemption
Massachusetts	Eggs must be labeled “Ungraded and Not Sized”
New Hampshire	Egg must be labeled “Not Sized”
Pennsylvania	Small producers may sell ungraded and un-weighed under an “Unclassified” label
Maine	Unclassified eggs may be sold under “Grade B” label
Connecticut	All direct sales to consumers
Rhode Island	No exemption from grading and sizing rules

Table 1: Egg Labeling Exemptions for New England States

Legal Structures

We examined what legal structures made the most sense for a producer aggregating eggs. The factors that were considered when examining different types of legal structures were: ease of formation and operation, role of farmer suppliers in management and capital formation, capacity to set beneficial pricing for farmer suppliers, limited liability for owners, role of the farmers in the company, capital structure, whether the company should be for profit or non-profit, and the structures that assist in marketing or contribute to a positive public perception of the product.

Benefit Corporation

Many times referred to as a “B Corp” the purposes of this corporation must include creating a public benefit. The board of a “B Corp” must not only consider shareholders but also the interests of employees, customers, the community, the environment, and their suppliers when making decisions. The public benefit of the B Corp must be certified by a third party auditor and the company must have a Public Benefit Director. This model could provide a favorable profit making legal structure for the aggregator because it would permit them to provide an advantageous pricing structure for participating farmers and otherwise manage the business in a way that would promote sustainable farming practices. In addition, this type of company would attract socially motivated investors and may be the best structure for raising non-farm capital. A Benefit Corporation seems to be easy to form and could also sell feed, cartons, and other inputs at discount to suppliers, and could sponsor educational forums on pasture based egg production.

Cooperative

A Cooperative is a profit making entity owned by its members. It should operate at cost and return profits to members. Vermont statutes literally refer to them as non-profit corporations. A majority of the capital in a cooperative must come from its farmer members. A portion of the capital needs may also come from debt. Farmer cooperatives are also eligible for a number of USDA local food grant programs. One difficulty of cooperative formation and management is getting farmers who are already very busy with their own farming operations to contribute to the start up and governance of another entity. While active farmer involvement is essential to the success of the co-op, most cooperatives will hire a general manager to provide day-to-day management.

The services offered by the cooperative could include washing, grading, marketing, distribution and providing technical assistance on pasture based egg production to improve profitability. It could also include bulk purchases of feed, egg cartons, and other inputs.

Being a cooperative would provide a positive marketing advantage and a farmer owned entity would ensure a greater portion of the consumer dollar ending up in the hands of the farmer since profits are returned to members in the form of patronage dividends. The legal formation of a cooperative is similar to forming a corporation and you must have at least 5 initial members who are all engaged in the production of agricultural products.

Limited Liability Company

An LLC is a potential profit making entity where one farmer producer or a group of producers owns the LLC who market their own eggs as well as eggs from farmers under contract with the LLC to produce eggs following best management practices. The farmer owners would bear the financial risk and have to raise the capital, but personal assets would not be at risk.

The LLC could provide a range of services: washing, grading, packaging, marketing and distribution. The LLC could also sell inputs such as feed to farmers under contract, provide washing, grading and packaging services or engage solely in marketing and distribution. For the purposes of marketing, there is no advantage to being an LLC and at the moment, a lot of contract farming has a bad reputation with consumers and farmers.

Operationally, there is no need for a board and the rights of the members of an LLC are outlined in an operating agreement. If the LLC chooses to be taxed as a Partnership, profits of the LLC flow through to its members, generally in proportion to their ownership stake. Overall, this research found that the LLC structure could provide for increasing a contract farmer's capital stake in the entity over time but it is unlikely that they would be able to achieve enough of a stake to control management and therefore it would not be a good investment.



Credit: *Maple Wind Farm*

Financial Summary

The project developed budgets based on the Best Management Practices. The budgets is based on scenario farms and make a number of assumptions. The assumptions in the budgets can be found in Appendix F. Farmers should complete their own detailed analysis before deciding whether to develop an egg enterprise as part of their farm. The farmer should consider their farm goals, labor availability and appropriateness of land and structures in the decision making process.

The financial viability of each enterprise is based on a number of factors. The management of production and management of the business are both important. As with any farm, focusing on efficiency and profitability are essential.



Production Management

The primary factors affecting net profit are feed efficiency and production levels. Feed efficiency is extremely important. A 1,000 bird flock that averages feed consumption of 0.3 pounds per bird/day will incur an additional \$4,107 annually in added feed expense over a flock that averages 0.25 pounds per bird/ day. More food does not necessarily equate to better lay rate. Production levels or lay rate are also very important. Management has profound effect on lay rate. A 1,000 bird operation with a lay rate of 70% would produce \$70,795 annually in egg sales while that amount would drop to \$50,568 if the lay rate dropped to 50%. This would mean a decrease in annual gross revenue of \$20,227 with very little difference in expenses. Both of these factors could be the potential between a layer enterprise making money or losing money. Producers should use the available spreadsheets available through University of Vermont Extension to calculate the specifics for their operation.

In addition, there are other production factors affecting profitability. Mobile housing will result in more infrastructure cost and more labor but the chickens will be able to access more land. Return on investment should be considered for investments in infrastructure and equipment, such as egg washers, roll-off nesting boxes and housing structures. When considering a choice of inputs such as bedding material, packaging and labels producers should find the most suitable products for their operation with both cost and quality in mind. See “Best Management Practices” for more information on packaging cost and sourcing.

Business Management

Record keeping both for production and financials are very important. Tracking productivity of flocks and planning successions have a profound effect on profitability. It is also important to focus on selling all of the eggs produced. Farmers should analyze the markets for the highest profit margin to ensure they are recognizing the most potential revenue possible. Each producer needs to understand cost of production and then price eggs accordingly rather than base their pricing on competing products.

Sample Budgets

Budgets have been created to assess the financial viability of both 1,000 and 3,000 layer enterprises. Using the best management practices, operating budgets and start-up capital budgets were created for both scale farms. These budgets are based on a large number of assumptions and any producer considering adding or expanding a layer operation should adjust these budgets to reflect their own farm. Start-up and operating costs are highly variable based on the resources available and management capacity of each individual farm operator. In our sample budgets, capital costs and some operating costs were covered through structured debt at average rates.

All budgets were calculated at a 70% annual lay rate with a 5% mortality rate. Feed consumption is estimated at 0.30 pounds/per bird/per day. The pay price of \$3.50 per dozen assumes that the eggs would be sold wholesale to small retailers and are being raised with conventional feed. Labor expenses are based on producer reports, which varied widely. For simplicity, the budgets assume an annual income and expense based on purchased pullets that lay at a consistent rate for the entire year. These numbers can vary based on the age of the purchased pullets and the management practices of the operator.

1,000 Layer Enterprise

The annual net income of the sample conventional 1,000 bird layer enterprise and selling all of their eggs at \$3.50 per dozen is -\$3,290. This number includes both debt service (capital and operating) and all labor paid at \$15.00 per hour. If the owner's labor is substituted for paid labor the net income is \$15,040. The cost of production per dozen before capital activity was \$3.32, which rose to \$3.71 per dozen when loan payments were added back in. When adjusted to account for payments against principle in the farm mortgage, the cost per dozen drops to \$3.61.

The largest expenses were feed, labor and pullets. Even when feeding conventional grain, feed costs accounted for \$1.08 per dozen produced. Labor accounts for another \$0.90 per dozen with an additional \$0.41 for pullet expense. These three expenses account for almost 64% of the total production expense and are the best place to focus on efficiency and cost cutting to increase profitability. Overhead in the 1,000 bird budget is calculated as 25% of farm overhead which assumes a mortgage on land and buildings that could facilitate the enterprise.

Capital Budget for 1,000 Bird Layer Enterprise

Created By Sam Smith, Intervale Center

Item	# of units	Cost Per unit	Total Cost	Comments
Housing				
Hoop house	1	\$ 8,478.50	\$ 8,478.50	Harnois 30*90
Winter waterer	5	\$ 100.00	\$ 500.00	Varies by producer
Lighting	10	\$ 30.00	\$ 300.00	Includes timers and bulbs
Feeders	6	\$ 22.15	\$ 132.90	Kuhl BL-50G-6
Egg-mobiles				
Roofing	5	\$ 300.00	\$ 1,500.00	
Running Gear	5	\$ 1,500.00	\$ 7,500.00	
Lumber/misc	5	\$ 500.00	\$ 2,500.00	
Water tanks	2	\$ 250.00	\$ 500.00	
Equipment				
Nesting boxes	10	\$ 294.00	\$ 2,940.00	
Waterers	12	\$ 18.90	\$ 226.80	Bell-matic 12
Poultry net	10	\$ 159.00	\$ 1,590.00	Premier Poultry 164'
Energizer	1	\$ 205.00	\$ 205.00	Speedrite 2000
Battery	1	\$ 100.00	\$ 100.00	
Farm truck	1	\$ 3,000.00	\$ 3,000.00	
Grain Bin	1	\$ 2,500.00	\$ 2,500.00	3-ton Poly
Cooler				
Coolbot	1	\$ 325.00	\$ 325.00	
Air Conditioner	1	\$ 515.00	\$ 515.00	
Materials	1	\$ 600.00	\$ 600.00	Insulation,Framing
Processing				
Egg cases-plastic	15	\$ 22.95	\$ 344.25	
Transportation				
Used Refrig. Van	1	\$13,000.00	\$13,000.00	
Total Capital Expense			\$46,757.45	

Sample Budget for 1,000 Bird Layer Enterprise

Created By Sam Smith, Intervale Center

Income	Unit	Number	Price per	Total
Eggs	Dozen	20227	\$ 3.50	\$ 70,795
Culls	Bird	950	\$ 1.00	\$ 950 5% Mortality Rate
Total Income				\$ 71,745

Expenses							
Variable			Per doz		VA		
Pullets	Bird	1000	\$ 8.25	\$ 0.41	11%	\$ 8,250	
Feed	Pounds	109500	\$ 0.20	\$ 1.08	31%	\$ 21,900	\$400/ton-0.30#'s day-365days
Grit	Pound	1000	\$ 0.25	\$ 0.01	0%	\$ 250	
Bedding-Hay	Bales	154	\$ 3.00	\$ 0.02	1%	\$ 462	Mulch hay 7 bales wk for 22 wks
Bedding-Shavings	Bales	104	\$ 5.50	\$ 0.03	1%	\$ 572	2 Bales/wk for 52 wks
Electricity	Month	12	\$ 75.00	\$ 0.04	1%	\$ 900	Cooler, heaters, lights
Misc Supplies				\$ 0.02	1%	\$ 500	
Labor-Production/Collection	Hours	572	\$ 15.00	\$ 0.42	12%	\$ 8,580	1 hr/day water and feed, 4hrs/wk general
Labor-Wash/pack/deliver	Hours	650	\$ 15.00	\$ 0.48	14%	\$ 9,750	1.5hr/day wash/pack 2hrs/wk delivery
Custom Hire				\$ 0.03	1%	\$ 600	Spring clean out, build windrows
Labels		20227	\$ 0.08	\$ 0.08	2%	\$ 1,618	
Cartons		20227	\$ 0.30	\$ 0.30	8%	\$ 6,068	
Marketing				\$ -	0%	\$ -	
Auto/distribution		3120	\$ 0.57	\$ 0.09	2%	\$ 1,763	(60 miles/wk)3120 miles @.565
Repairs and maintenance				\$ 0.02	1%	\$ 400	
Interest on operating capital				\$ 0.02	0%	\$ 334	\$12,000 Operating line, 7%
Total Variable				\$ 3.06	86%	\$ 61,947	
Fixed				\$ -	0%		
Insurance				\$ 0.03	1%	\$ 540	Product liability /portion of general farm
Taxes				\$ 0.06	2%	\$ 1,250	25% of farm property tax
Mortgage				\$ 0.17	5%	\$ 3,368	25% of farm mortgage
Total Fixed				\$ 0.25	7%	\$ 5,158	
Total Expenses				\$ 3.32	94%	\$ 67,105	

Net Income	\$ 0.23	\$ 4,640
Loan for Start-up/Capital expense	\$ 0.39	\$ 7,930 \$46,757 at 5% for 7 years
Net after Capital Expense	\$(0.16)	\$ (3,290)
Net after Capital without Paid Labor	\$ 0.21	\$ 15,040

3,000 Layer Enterprise

The annual net income of the sample 3,000 bird layer enterprise is \$17,023 after capital activity. This number includes \$35,490 in paid labor, much of which would probably be done by the owner-operator. It also includes \$19,896 in annual debt service for start-up expenses and \$1,002 in interest on annual line-of-credit. The cost of production per dozen was \$2.91 per dozen before debt service. This number rises to \$3.24 per dozen when debt service is included. Adjustments for payments against principle on the farm mortgage bring the cost of production to \$3.16 per dozen.

Overhead allocation in the 3,000 bird budget is increased to 50% of farm overhead (mortgage, taxes, insurance) with additional expense for a tractor for manure handling. The capital budget includes the purchase of an egg washer and materials to renovate a processing space. The capital expenses related to mobile chicken houses are eliminated in this budget with the assumption that the producer would move to fixed hoop houses with a number of paddocks around them.

The 3,000 bird budget does not include the potential cost savings from the increased volume of grain purchased and consumed. There is potential to recognize reduced feed expenses but it is highly dependent on the specific grain dealer and storage capacity of the farm.

Organic Production

Organic egg production presents an opportunity in terms of additional market opportunities and higher income per dozen. It also has higher expenses primarily related to the purchase of feed and pullets. Organic feed prices can range up to twice the cost of conventional feed. This brings the cost of production per dozen in the 1,000 bird model to \$4.82. The additional costs of organic pullets, certification, and other organic inputs would also cause the cost of production to rise.

Capital Budget for 3,000 Bird Layer Enterprise

Created By Sam Smith, Intervale Center

Item	# of units	Cost Per unit	Total Cost	Comments
Housing				
Hoop house	3	\$ 8,478.50	\$ 25,435.50	Harnois 30*90
Waterers	15	\$ 100.00	\$ 1,500.00	Varies by producer
Lighting	30	\$ 30.00	\$ 900.00	Includes timers and bulbs
Nesting boxes	30	\$ 294.00	\$ 8,820.00	
Utilities to hoop houses	3	\$ 3,000.00	\$ 9,000.00	Electric and water lines
Equipment				
Poultry net	30	\$ 159.00	\$ 4,770.00	Premier Poultry 164'
Energizers	3	\$ 205.00	\$ 615.00	Speedrite 2000
Feeders	18	\$ 22.15	\$ 398.70	Kuhl BL-50G-6
Water tanks	3	\$ 250.00	\$ 750.00	
Grain bin	1	\$ 3,500.00	\$ 3,500.00	8.5 ton poly
Cooler				
Walk-in Cooler	1	\$ 12,000.00	\$ 12,000.00	
Processing				
Egg Washer	1	\$ 12,600.00	\$ 12,600.00	Sani-touch 5s
Egg cases-plastic	50	\$ 20.95	\$ 1,047.50	
Processing room	1	\$ 10,000.00	\$ 10,000.00	
Transportation				
Farm truck	1	\$ 6,000.00	\$ 6,000.00	
Refrigerated box truck	1	\$ 20,000.00	\$ 20,000.00	
Total Capital Expense			\$117,336.70	

Sample Budget for 3,000 Bird Layer Enterprise

Created By Sam Smith, Intervale Center

Income		Unit	Number	Price per	Total	
Eggs	Dozen	60681	\$ 3.50			\$ 212,384
Culls	Bird	950	\$ 1.00			\$ 950 Accounts for Mortality Rate
Total Income						\$213,334
Expenses						
Variable						
Pullets	Bird	3000	\$ 8.25	\$ 0.41	12%	\$ 24,750
Feed	Pounds	328500	\$ 0.20	\$ 1.08	31%	\$ 65,700 \$400/ton-0.30#'s day-365days
Grit	Pound	3000	\$ 0.25	\$ 0.01	0%	\$ 750
Bedding-Hay	Bales	462	\$ 3.00	\$ 0.02	1%	\$ 1,386 Mulch hay 21 bales wk for 22 wks
Bedding-Shavings	Bales	312	\$ 5.50	\$ 0.03	1%	\$ 1,716 6 Bales/wk for 52 wks
Electricity	Month	12	\$175.00	\$ 0.03	1%	\$ 2,100 Cooler, heaters, lights, washer
Misc Supplies				\$ 0.02	1%	\$ 1,500
Labor-Production/Collector Hours		1144	\$ 15.00	\$ 0.28	8%	\$ 17,160 2 hr/day water and feed,8hrs/wk general
Labor-Wash/pack/deliver	Hours	1222	\$ 15.00	\$ 0.30	9%	\$ 18,330 2.5hr/day wash/pack 6hrs/wk delivery
Custom Hire				\$ -	0%	\$ -
Labels		60681	\$ 0.08	\$ 0.08	2%	\$ 4,854
Cartons		60681	\$ 0.30	\$ 0.30	9%	\$ 18,204
Marketing				\$ 0.02	0%	\$ 1,000
Auto/distribution		6240	\$ 0.57	\$ 0.06	2%	\$ 3,526 (120 miles/wk)6240 miles @.565
Repairs and maintenance				\$ 0.02	1%	\$ 1,200
Interest on operating capital				\$ 0.02	0%	\$ 1,002 \$36,000 at 7%
Total Variable				\$ 2.69	76%	\$163,178
Fixed						
Insurance				\$ 0.04	1%	\$ 2,500 Product liability /portion of general farm
Taxes				\$ 0.04	1%	\$ 2,500 50% of farm property tax
Mortgage				\$ 0.11	3%	\$ 6,736 50% of farm mortgage
Equipment				\$ 0.02	1%	\$ 1,500 Tractor and manure spreader annual cost
Total Fixed				\$ 0.22	6%	\$ 13,236
Total Expenses				\$ 2.91	83%	\$176,414
Net Income				\$ 0.61		\$ 36,919
Loan for Start-up/Capital expense				\$ 0.33		\$ 19,896 \$117,336 at 5% for 7 years
Net After Capital				\$ 0.28		\$ 17,023
Net after Capital without Paid Labor				\$ 0.87		\$ 52,513

Appendix A: Egg Aggregator Model Food Safety Regulatory Scan

By Annette Higby

Assumptions: An egg producer with +/- 3,000 hens will aggregate, wash, grade, pack, market and distribute his own eggs and eggs from other farms with fewer than 3,000 hens. The aggregator entity will market primarily to retail outlets, potentially into interstate commerce. Also considered is a stand-alone, off-farm facility that packs and holds eggs produced by participating farmers.

Shell egg regulation is extensive. The Food and Drug Administration (FDA), USDA (through the Agricultural Marketing Service (AMS) and the Food Safety Inspection Service) and the Vermont Agency of Agriculture Food and Markets (VAAFMM), all regulate the production, storage, handling, transportation, grading, refrigeration, packaging and sale of shell eggs. Over time, FDA jurisdiction over shell eggs has become primary, superseding and overtaking AMS and FSIS jurisdiction and authority.

3,000 birds is a kind of regulatory cliff for the purposes of FDA's rules for the prevention of salmonella enteritidis (SE). This could be especially problematical given FDA draft guidance on SE control measures for layers with outdoor access explained later in this document. Other FDA measures regarding refrigeration during storage and transport will apply regardless of size of flock.

The first iteration of the proposed FSMA preventive control rule, issued in January of 2013, created a second regulatory cliff for farms handling raw agricultural commodities produced on other farms, imposing registration, and requiring compliance with Good Manufacturing Practices and Hazard Analysis and Critical Control Points plans. A Supplementary Proposed rule issued by FDA on September 19, 2014, however, proposed substantial changes to the definition of several terms including farm, holding, and packing. The result is a significant expansion of the number and quality of exempt activities that can be performed on eggs and other raw agricultural commodities (RACs) "on a farm" under one ownership and in one general location, upon RACs produced on that farm or on farms owned by others.

Food and Drug Administration Regulation of Shell Eggs

FDA has issued rules for the prevention of salmonella enteritidis in shell eggs, rules requiring refrigeration of eggs during transport to a processing facility and during retail distribution, food safety labeling requirements for egg cartons, and registration requirements for "food facilities" under the Bioterrorism Preparedness Act. FDA has

also issued an extensive set of proposed regulations under the Food Safety Modernization Act relating to the growing and harvesting of produce and food manufacturing and processing activities that occur on farms.

Prevention of Salmonella Enteritidis in Shell Eggs During Production, Storage and Transportation

Producers and Processors Subject to the FDA - SE rule:

There are two parts to the SE rule. The first part imposes biosecurity measures, testing, and recordkeeping requirements on farms with flocks of more than 3,000 laying hens. The second part imposes refrigeration requirements on anyone who holds or transport table eggs regardless of size. Both parts apply whether the eggs are marketed inter or intrastate.

1. Any producer with more than 3,000 laying hens at a particular farm and where any of the eggs are produced for the table market must undertake the SE prevention measures required by the rule except when:

- All eggs are sold directly to consumers; or
- All eggs are treated with a process or technology that achieves at least a 5-log destruction of SE. (Pasteurization)

The rule refers specifically to laying hens. Pullets, then, do not count against the 3,000-bird exemption. For farms with more than 3,000 hens, however, pullets, must still be monitored for SE. Farm means all poultry houses and grounds immediately surrounding the poultry houses covered under a single bio-security program. Flocks held at different farms are counted separately. Location determines the count rather than ownership.

21 C.F.R. §118.1 and §118.3

2. Anyone who transports or holds shell eggs for shell egg processing must comply with refrigeration requirements as follows:

- Unless transported within 36 hours of lay, eggs must be transported at or below 45° F ambient temperature.
- Beginning 36 hours after laying, eggs must be held at or below 45° F ambient temperature.
- An equilibrium step is allowed to allow eggs to reach room temperature prior to washing or other processing to temper the eggs.

A shell egg processing facility is any facility that processes – washes, grades and packs shell eggs for the table market. An egg aggregator engaged in transporting, washing,

grading and holding eggs for the table market would be considered a processing facility for the purposes of the SE rule and would have to comply with the refrigeration rule.

The refrigeration rule applies to anyone who holds or transports shell eggs for the table market regardless of size. It would apply to the participating farms if they hold eggs for longer than 36 hours or if they are transporting their eggs to the aggregator later than 36 hours after lay. It would also apply to the aggregator farm regardless of size. And if the aggregator farm had more than 3,000 laying hens at a particular farm, the rest of the SE prevention rules would also apply.

21 C.F.R §118.1(b), §118.3 and 118.4(e)

Covered farms must:

1. Register with the FDA as a facility. Producers must also develop and implement an SE prevention plan for each farm that includes at a minimum the following SE prevention measures:

Pullets

- Pullets must be obtained from SE monitored breeding flocks;
- The pullet environment – each poultry house - must be tested when pullets are 14 to 16 weeks of age. If the test is negative no further testing is required until the birds reach 40 to 45 weeks of age.
- If the test is positive for SE:
 - Eggs must be diverted to treatment for the life of the flock, OR eggs must be tested within 2 weeks of the start of egg laying.
 - The pullet environment must be cleaned and disinfected. Producer must remove all visible manure, dry cleaning to remove all dust feathers and old feed, followed by disinfecting by fumigation.

§118.4(a)(2)(iii), §118.6(a)(1), §118.4(a)(3)

Biosecurity

The producer must take step to ensure that there is no introduction or transfer of SE into or among the poultry houses. At a minimum these steps must include:

- Limit visitors to the farm and in the poultry houses.
- Adopt practices that will protect against cross contamination when equipment or people move between houses.
- Prevent stray poultry, wild birds, cats and other animals from entering poultry houses. See additional analysis about FDA guidance on layers with outdoor access below.
- Not allow employees to keep birds at home.

Rodents, Flies and other Pest Control

Producer must monitor for rodents and flies and use appropriate methods to achieve control within a poultry house.

Producer must also remove debris within and outside a poultry house that may provide a harbor for pests.

§118.4(c)

Cleaning and Disinfecting Poultry Houses

Poultry houses must be thoroughly cleaned and disinfected before new laying hens are added and whenever there is a positive SE environmental or egg test. Cleaning entails removing all visible manure, dry cleaning to remove all dust feathers and old feed, followed by disinfecting by fumigation.

Laying Hens

Producer must conduct an environmental test when any group of hens within a poultry house reaches 40 to 45 weeks. If the flock contains multiple ages, the producer must test whenever any group reaches 40 to 45 weeks of age. If the test is positive and the birds will not undergo a forced molting, no further tests are required – unless there are birds in the same group that have not yet reached 40 to 45 weeks.

Environmental testing must be conducted in accordance with the FDA's Environmental Sampling and Detection of Salmonella in Poultry Houses or a an equivalent method in accuracy.

<http://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm114709.htm>

If the environmental SE test is positive:

- The poultry house must be cleaned and disinfected.
- Eggs must diverted for treatment for the life of the flock in that poultry house OR a sample of eggs – a minimum of 1000 intact eggs - must be tested four times at 2 week intervals. If all four tests are negative, no further testing is necessary.
- If any of the egg samples test positive, all eggs from that flock must be diverted to treatment until 4 consecutive bi-weekly negative test are obtained. Thereafter, eggs from that flock must be tested once a month for the life of the flock. Whenever, there is a positive test the eggs must be diverted until there are four consecutive bi-weekly negative tests.

Diverted eggs must be labeled and all documents accompanying shipment must contain this statement: “Federal law requires that these eggs must be treated to achieve at least a 5-log destruction of Salmonella Enteritidis or process as egg products in accordance with the Egg Products Inspection Act, 21 CFR §118.6(f).”

21 C.F.R. §118.5, §118.6(a)(2) and §118.6(b)-(f)

There must be one supervisory employee responsible for ensuring compliance with the SE prevention plan that has received training using an FDA approved curriculum or who is otherwise qualified through job experience. This person must develop and implement the plan, reassess and modify the plan when necessary and review record keeping. This person need not be an on site employee.

21 C.F.R. §118.9

Recordkeeping

1. A written SE prevention plan
2. Documentation that:
 - Pullets were raised under SE monitored conditions
 - Compliance with SE plan requirements with respect to biosecurity measures; Rodent and other pest control measures; cleaning and disinfection of poultry houses; refrigeration; environmental and egg sampling procedures; results of testing; diversion of eggs, if applicable.
 - Records documenting review and any modifications to the SE prevention plan.
3. Compliance activities must be entered at the time the activity is performed or observed.
4. Records must be kept for one year after the flock to which they pertain has been taken permanently out of production.

FDA is responsible for enforcement of the SE prevention rules but in Vermont inspection is conducted by the VAAF. Upon a finding that any shell eggs have been produced or held in violation of the SE rule, any district FDA office, or any State Agency acting under FDA enforcement authority may order the eggs to be diverted for processing. Hearing and other due process rights are provided under §118.12(a). Inspection must be permitted under §118.12(b)

Rules Regarding Layers with Outdoor Access

In July of 2013 FDA issued draft guidance (OA Guidance) on the application of the SE rule for layers with outdoor access. They opened a 60-day comment period on their draft guidance and the comments particularly from the organic community were vociferous. It isn't clear when a final guidance may issue. The draft guidance can be found here: <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Eggs/ucm360028>

The draft guidance describes four typical housing styles – their description of “Pasture Containing an Indoor Area” is the closest fit to the pasture system described in the Poultry Project BMPs. For flocks larger than 3,000 birds, the guidance would interfere significantly with the BMPs related to free choice feeding, integration of other livestock, a rotational pasture system, fencing, the use of guard dogs, and other BMPs.

FDA: Pasture containing an indoor area: An indoor area is located within an outdoor fenced pasture. The indoor area may be a permanent structure or it may be a moveable structure. Moveable structures may be built on skids, or movable trailers retrofitted with next boxes may be used. The pasture area may have no coverage overhead or it may be covered with netting, and the size of the pasture varies greatly. If the indoor area is movable, the housing system usually is designed such that the pastures can be rotated, i.e., the fencing surrounding the pasture can be moved or relocated to fence a fresh patch of pasture. In systems with a moveable structure access to the outdoor pasture area is through some type of opening in the structure, e.g., an open gate if retrofitted trailer is used.

Pasture is not considered part of the poultry house and does not need to be tested for SE. The indoor structure, however, is considered a poultry house. The indoor structure then must be disinfected prior to introduction of birds, must be tested for SE at appropriate intervals and must be monitored for flies and rodent activity. The producer must use appropriate methods to achieve satisfactory control. The producer would also have to have a written SE prevention plan, test eggs in the event of a positive SE, divert if necessary and maintain the records of compliance described above.

Both the final rule SE rule and the OA Guidance indicate that producers must keep stray poultry, wild birds, cats and other animals from entering the poultry houses. The OA suggests that producers must also take steps to prevent stray poultry, wild birds, cats and other animals from entering the pasture access area. Producers may use a fence, high wall, or similar structure. The fencing should extend below ground and be tall enough to prevent animals from leaping over it, and be made of a materials such as wire mesh that is resistant to chewing or gnawing by the undesired animals. Additional measures should be used to exclude mice, rats and voles such as trapping or baiting.

To prevent wild birds from entering the pasture access area producers can use netting. The covering should extend to and connect with the top of any fencing structure and care should be taken to prevent wild birds from roosting on any pole or structure supporting the netting. Producers can also temporarily confine layers during periods of wild fowl migration, limit access to pasture during hours when wild birds are not likely to be present, use of noise cannons to scare wild birds away and maintaining attractions such as feed and water in areas where they do not attract wild birds.

FDA: “The presence of wild birds in an outdoor access area indicates that this route of exposure of the flock to SE is not adequately controlled.”

Producers must also monitor for and control rodents and flies in a pasture area and use satisfactory methods to achieve control.

While recognizing that complete exclusion of rodents from an outdoor pasture area may be impossible they recommend the following actions to reduce their populations:

- Maintain a 6-foot wide area around the outside periphery of the outdoor access area, filled with gravel or other non-grass substance – or at least maintain the grass within this area at a short height.
- Remove piles of old material, stacks of straw or hay, trash, weeds, debris, vegetation and any other material both inside and immediately outside the outdoor access area since these can provide harborage for rodents. (Emphasis supplied.)
- Remove any dead carcasses daily and dispose of them properly.
- Minimize spillage of feed and remove remnants of feed at outdoor feeding sites.
- Minimize access by rodents to feed and water stations.

In addition to observation and visual inspection, monitoring for rodents entails the use of chew cards or bait cards. If five percent or more of the card is eaten it indicates moderate rodent activity. An eaten area of less than 5 percent indicates satisfactory control. To address unacceptable rodent activity, FDA recommends a triple line of defense – three successive lines of baiting stations, checked weekly.

Monitoring for flies entails the use of spot cards, scudder grills, baited traps or sticky traps. Devices should be placed on poles strategically placed on stakes off the ground, preferably under cover to keep device out of direct sunlight. The following indicates satisfactory fly control:

- A spot card index of 50 or fewer per card.
- A weekly count of 50 or fewer on a fixed sticky tape.
- A count of 75 or fewer on moving sticky tape.
- A count of less than 20 on a scudder grill.
- A count of 250 or fewer flies per week in a baited trap.

To control flies in pasture FDA recommends mechanical and physical methods requiring some type of bait or fly attractant. They also recommend the elimination of fly breeding sites. Insecticides unless approved for poultry farms and used correctly should not be used.

Cleaning and disinfecting outdoor access areas – FDA recognizes that pasture rotation or allowing land to lie fallow as a means of “cleaning and disinfecting.” A specific fallow period is not specified.

FDA - Food Labeling, Safe Handling Statements, Labeling of Shell Eggs; Refrigeration of Shell Eggs Held for Retail Distribution. 21 C.F.R. §101

There are two parts to this set of regulations:

1. All shell egg cartons, whether in inter or intrastate commerce must include safe handling instructions that appear prominently and conspicuously and exactly as follows:

SAFE HANDLING INSTRUCTIONS: To prevent illness from bacteria: keep eggs refrigerated, cook eggs until yolks are firm, and cook foods containing eggs thoroughly.

The text must be set off in a box with a hairline border. If the shell eggs are not for direct sale to consumers, the safe handling instructions must appear on invoices or bills lading.

2. “Retail establishments” must also promptly refrigerate untreated shell eggs when received and store the eggs at 45° or cooler. A “retail establishment” is any operation that stores, prepares, packages, serves, vends, or otherwise provides food for human consumption. 21 C.F.R. §115.50(a). Unless the aggregator or the individual producers are selling direct to consumers at an on-farm retail establishment this rule does not apply.

Enforcement: Retail establishments must permit inspection by FDA or State at any reasonable time, including sampling of eggs and inspection of equipment and any records relating to the equipment or eggs as may be necessary. §115.50(f). Upon a finding that any shell eggs have been held in violation of this section, an authorized FDA representative or a State or local representative may order such eggs to be diverted for processing or destroyed. §115.50(e)(1) Appeal rights and an informal hearing are also provided.

While enforcement is to be a cooperative endeavor with states, these rules preempt state and local rules on labeling and refrigeration. States can continue to enforce their own standards provided they are equal to or more stringent than the federal standard.

FDA: Rules for the Registration of Food Facilities Under the Public Health Security and Bioterrorism Preparedness and Response Act

Post 9/11, as a terrorism preparedness measure, Congress required that all food processing facilities register with the FDA. “Farms” were exempted from the registration requirement, but the definitions of a “farm” and a “facility” used by FDA were both confusing and overly broad, encompassing farms that that pack or hold food produced by other farms. This broad definition was the precursor to imposing significant food safety measures on farms under the Food Safety Modernization Act.

A 2014 Supplemental Proposed Preventive Control rule issued by FDA re-defines farm and in the process exempts on farm aggregation operations that pack, hold and package raw agricultural commodities from the need to register. Under the new Supplementary proposed rule, a farm is defined as an establishment under one ownership in one general location, devoted to growing and harvesting of crops and/or raising of animals; farms may also pack or hold raw agricultural commodities; or package and label raw agricultural commodities. They can perform these activities on their own RACs and

upon RACs produced by others and will still be exempt from having to register as a food facility with FDA.

Harvesting includes washing and cooling RACs. Packing includes cooling, mixing, grading, and washing, as well as putting food in containers. Holding includes cooling, grading, labeling and storing.

Under the 2014 Supplemental rule, an egg aggregation entity with its own farming operation, and with an on-farm packing, holding facility could aggregate, wash, grade, package and label its own eggs as well as eggs produced on other farms without having to register with FDA.

A stand-alone and off-farm egg aggregation facility engaged in packing and holding eggs, however, would be subject to facility registration. As the need to register as a facility, triggers additional oversight, a stand alone and off farm egg aggregator – unless it was under inspection by USDA under the Egg Products Inspection Act – would also have to comply with additional FDA rules described more fully below. An aggregator that processed eggs, cooking them, for example would also have to register and comply with additional rules.

The reference to an “establishment under one ownership” could be problematical for the cooperative form of ownership. In the preamble to the Produce Safety 2014 Supplemental, FDA seeks comment on whether cooperative ownership by multiple growers should be considered as “under the same ownership.” It’s an absurd distinction given that most other legal structures would also entail ownership by multiple growers, members or shareholders.

FDA: Food Safety Modernization Act

FDA issued two proposed rules implementing the Food Safety Modernization Act in January of 2013.

One rule proposed new food safety rules for the Growing, Harvesting, Packing and Holding Produce for Human Consumption (Produce Safety Rule). The second rule updated the Current Good Manufacturing Practices in manufacturing, packing or holding human food. This second set of rules also imposed HACCP like controls, requiring food facilities to implement Hazard Analysis and Risk-Based Preventive Controls for human food (Preventive Control Rule).

FDA received some 8,000 comments on the FSMA rules. In response to the hailstorm of criticism in the comments, they issued two Supplemental Proposed Rules in September of 2014, making significant changes to both the Produce Safety and Preventive Control rule.

Current Good Manufacturing Processes – 21 C.F.R. §110

Under current rules an egg aggregator that aggregates, washes, grades, packages and distributes is exempt under the Raw Agricultural Commodity (RAC) exemption under CGMP.

Existing §110.19(a) exempts from GMPs: Establishments engaged solely in the harvesting, storage, or distribution of one or more “raw agricultural commodities,” as defined in section 201(r) of the act, which are ordinarily cleaned, prepared, treated or otherwise processed before being marketed to the consuming public.

(r) The term "raw agricultural commodity" (RACs) means any food in its raw or natural state, including all fruits that are washed, colored, or otherwise treated in their unpeeled natural form prior to marketing.

Eggs are RACs and FDA staff has indicated that they are currently exempt from GMPs.

The 2013 Proposed Rule would have required compliance with CGMPs for any farm aggregating their own and other’s RACs.

The 2014 Supplemental Proposed Preventive Control, however, exempts “farms” from having to comply with CGMPs. [§117.5(k)] A farm is defined as an establishment under one ownership and in one general location devoted to growing and harvesting of crops and/or raising of animals; farms may also pack or hold raw agricultural commodities; or package and label raw agricultural commodities. They can perform these activities on their own RACs and upon RACs produced by others and will still be exempt from CGMPs.

The 2014 Supplemental rule also provides that harvesting, packing and holding all include activities incidental to those functions. Harvesting, for example, includes washing and cooling RACs. Packing includes cooling, mixing, grading, labeling and washing, as well as putting food in containers. Holding includes cooling, grading and storing.

Under the 2014 Supplemental rule, an egg aggregation entity with its own farming operation, and with an on-farm packing, holding facility could aggregate, wash, grade, package and label its own eggs as well as eggs produced on other farms without having to comply with CGMPs.

A stand alone, off farm aggregation facility, however, would have to comply with CGMPs. A summary of the revised CGMPs is including in the Appendices.

Recordkeeping

The 2014 Supplemental redefinition of farm also means that farms that are holding or packing their own RACS and the RACs of others do not have to comply with FDA recordkeeping requirements. [§1.328] Farms that are holding or packing their own

RACs and the RACs of others do not have to maintain records of the immediate previous source or the immediate subsequent recipients of the RACs.

A stand alone, off farm aggregator would have to maintain records of source and purchasers of eggs.

Hazard Analysis and Risk Based Preventive Controls

In addition to updating the Current Good Manufacturing Practices for manufacturing, packing or holding human food, the 2013 proposed rule also imposed HACCP like controls on food processing and manufacturing, requiring food facilities to implement Hazard Analysis and Risk-Based Preventive Controls for human food (Preventive Control Rule).

Under the 2013 proposed rule, aggregation of raw agricultural commodities such as eggs produced by others triggered a much higher regulatory threshold under the Preventive Control Rule. Normal harvesting, packing and holding activities – washing, cooling, grading, packing, for example when performed by a farmer, on their own farm on their own eggs were exempted from the Preventive Control rule. When these same activities were performed off farm or on a farm that is washing, cooling or packing the raw agricultural commodities produced by other farms, those activities were considered to be manufacturing - the Preventive Control Rule applied and unless an exemption fits, the facility would have to prepare written Hazard Analysis and Critical Control Point plan.

The Supplemental Rule issued in September 2014 did a complete about face on this issue. The Preventive Control Rule only applies to establishments required to register as a facility under the Bioterrorism Preparedness Act. The 2014 Supplemental rule exempts on farm establishments that pack or hold RACs produced on that farm and RACs produced on other farms from having to register with the FDA, and thus, exempts them from the necessity of preparing a HARPC plan.

A stand alone, off-farm egg aggregation facility, however, unless otherwise exempt, would be subject to the HARPC rules.

HARPC Exemptions:

There is a “qualified exemption” for some facilities. It is qualified in the sense that these facilities must utilize alternative food safety measures and have alternative compliance requirements.

Qualified facilities include:

1. A Very Small Business. In the 2014 Supplemental rule, FDA defined a VSB as any business with less than \$1 million in total annual sales of human food, adjusted for inflation.

Or

2. A facility that:

- During the 3-year period preceding the applicable calendar year, more than one-half of the average annual monetary value of the food manufactured, processed, packed or held at such facility was sold directly to “qualified end-users” located in the same state or within 275 miles of the facility. A qualified end user includes consumers, restaurants or retail food establishments; AND
- The average annual monetary value of all food sold during the 3-year period preceding the applicable calendar year was less than \$500,000.

Retail food establishment would include grocery stores, and food co-ops as well as roadside stands, CSAs, and farmers markets. Meeting the qualified end user test would seem relatively simple. The very small business exemption is much more straightforward. A more difficult question is whether a facility operating at this scale could be profitable.

Facilities with a qualified exemption must still comply with modified requirements as follows:

Qualified facilities must submit documentation every two years establishing:

1. Eligibility for the qualified exemption;
2. Documentation that the owner has identified the potential hazards associated with food being produced, is implementing preventive controls and is monitoring performance; OR
3. Documentation that the facility is in compliance with state, local county or other applicable non-federal food safety law – provided that label on food packaging or invoices includes name and complete business address of the facility.

It’s not clear what Vermont food safety law would apply to egg aggregation, although compliance with Vermont Department of Health good manufacturing practices might suffice.

A stand alone off farm facility could also choose to be inspected by USDA exercising its jurisdiction under the Egg Products Inspection Act. Inspected plants are exempt from registration and therefore exempt from HARCP. Inspection would involve inspection fees and compliance with CGMP like sanitation requirements.

If not exempt, the facility must prepare a written Hazard Analysis and Risk Based Preventive Control plan food safety plan.

HARCP

FDA's Preventive Control Rule requires a written food safety plan prepared by a "qualified individual." A qualified person is someone who has received training on the prevention of risk based preventive controls under a curriculum recognized as adequate by the FDA or someone who is otherwise qualified through job experience in food safety systems. The plan must include an analysis of reasonably foreseeable hazards for each type of food manufactured, processed, packed or held at the facility to determine whether there are significant hazards. It must also include:

- Preventive controls or practices that will be used to minimize or prevent the identified hazards;
- Food allergen controls;
- Sanitation controls or practices that will be used to minimize or prevent exposure to environmental pathogens;
- A recall plan;
- Written procedures for monitoring preventive controls;
- Corrective action procedures;
- Verification procedures.

Records must be kept that document monitoring of preventive controls, corrective actions, verification, and training of the qualified individual. Records must be created concurrently with the actions and include the signature or initials of the person performing the action. Records must be maintained for 2 years.

1. Produce Safety Rules

Unless exempt from FSMA, participating egg producers who also produce vegetables for human consumption must comply with the Produce Safety Rule.

Generally, the Produce Safety rules entail the following sets of standards.

- A. Standards directed to Biological Soil Amendments of Animal Origin;
- B. Standards directed to Domesticated and Wild Animals;
- C. Standards directed to Health and Hygiene;
- D. Standards directed to Growing, Harvesting and Packing Produce;
- E. Standards directed to Agricultural Water.

Exemptions:

1. A farm with an average annual monetary value of produce sold during the previous 3-year period of less than \$25,000. (The 2014 Supplemental revised the exemption from all food sold to value of produce sold.) Produce is defined as any fruit or vegetable including mushrooms.

2. A farm that markets more than ½ of all food sold during the previous 3 year period directly to consumers, restaurants, or grocery stores (qualified end users) within a 275

mile radius of the farm or within the state **AND** the average annual monetary value of all food sold during the preceding 3-year period was less than \$500,000.

Food includes all food sold for human or animal consumption. Sales of hay, silage, and bulk milk are all included in the \$500,000 exemption calculation. The mix of crop and marketing methods for a particular poultry producer participant may be more problematical than coming in under the \$500,000 gross sales figure. The aggregator egg processing facility will not be a Qualified End-user. Significant egg sales to the aggregator coupled with any other bulk commodity sales, wholesale marketing or other sales not direct to consumers, restaurants or grocery stores, may make it difficult to meet the 51% direct to QEU's test.

The 2014 Supplemental Rule revised two of the more controversial requirements of the Produce Safety Rule. The manure rule, which required a 9-month interval between application and harvest of produce, was removed to allow FDA to conduct additional research. The water testing rules were also significantly revised to recognize die off rates for pathogens in irrigation water.

USDA / AMS and FSIS Regulations Under the Eggs Product Inspection Act - 7 CFR §57

USDA has split administration of the Egg Products Inspection Act between AMS and FSIS. AMS regulations require that shell egg handlers, who grade and pack for the ultimate consumer must register with the Department of Agriculture. Producer packers with an annual egg production from a flock of 3,000 hens or less are exempt from registration.

In addition to registration, the rule provides for regular inspection of "egg handlers" to ensure that eggs are not adulterated and that restricted eggs – cracks, checks, dirties, incubator rejects, inedibles, leakers and other loss eggs, are disposed of properly.

An "egg handler" is any person who engages in any business in commerce (intra or interstate) that involves buying or selling any eggs or processing any egg products or otherwise using any eggs in the preparation of human food. An egg aggregator would be considered an egg handler. A producer packer with fewer than 3,000 hens, however, is exempt from inspection.

7 C.F.R. §57.28 requires periodic inspections of business premises, facilities, inventories, operations, transport vehicles, and records of egg handlers. For shell egg packers, inspection shall be made a minimum of once each calendar quarter. In Vermont, inspection is conducted by the VAAFM.

AMS also provides official standards for quality; grades and weight classes for shell eggs which can be found here:

<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELDEV3004376>

In addition to inspection, the rules also require record keeping under 7 C.F.R. §57.200. Anyone engaged in the business of transporting, shipping, or receiving any eggs in inter or intrastate commerce, or holding such articles so received, and all egg handlers, must maintain for 2 years records showing the receipt, delivery, sale, movement, and disposition of all eggs handled by them and make these records available to USDA/VAAFAM upon request. Producer packers with a flock of 3,000 hens or less are exempt from the record keeping requirements.

All egg handlers must maintain production records as well as names and addresses of the shipper and receiver, the date of the transaction, the quality of the eggs (graded eggs, nest run eggs, dirties, checks, leakers, loss, inedible eggs), and the quantity of the eggs.

Producers, who ship all of their production, as nest-run eggs without segregation need only to maintain records indicating the amount of shell eggs shipped, date of shipment, and the receivers' name and address.

FSIS regulations under the Egg Products Inspection Act require all egg handlers to store and transport eggs packed for the ultimate consumer at an ambient temperature of 45° and to include a statement on the label indicating refrigeration is required. Producer packers with a flock of fewer than 3,000 hens are exempt from these requirements but are required to refrigerate under FDA SE Prevention rules. (9 C.F.R. §59) Egg handlers must also permit inspection to assure compliance.

Regulations involving the voluntary grading of Shell Eggs

7 CFR §56

- Provides for voluntary, (continuous, non-continuous, or temporary) licensed federal or state inspection at an official (means inspected) egg packing plant for a fee. Inspected eggs can carry a USDA seal.
- Sets standards for equipment for inspected plants – (Thermometer, digital display scales, two candling lights and booth and furnished office space for the inspector.)
- Sets standards for facilities and outside premises similar to GMPs 7 CFR §56.76. The rules are extensive not fully covered here. For example: shell egg washing equipment must be sanitarily designed, maintained in a clean and sanitary manner and thoroughly cleaned at the end of each operating day. Temp of the wash water must be maintained at 90° or higher and must be at least 20° warmer than the internal temperature of the egg. Spray rinsed with a sanitizer. Refrigerated at 45°, etc.

Vermont Egg Regulation

VAAFAM published rules require that eggs be graded, uniformly sized and appropriately packaged. The published rules implement Vermont law on the subject found at 6 V.S.A. §351.

Under §351(a) any egg labeled as a “Fresh Egg” must meet federal and state standards for Grade A eggs, and that determination must be made by candling.

Under § 354 each egg container being sold, exposed, offered, or advertised for sale or exchange in Vermont for human consumption must be plainly and conspicuously marked with the proper designation of size and quality grades as promulgated by the VT Secretary of Agriculture. The size requirement shall not prevent a producer from selling eggs of mixed sizes to a dealer, provided that when selling mixed sizes, the producer plainly marks each lot “mixed sizes” or “nest run.” Dealers selling mixed sizes to other dealers must mark each lot of mixed quality as “ungraded” and each lot of mixed sizes as “mixed sizes.”

VAAFAM Regulations promulgated under 351 provide that:

1. A producer is anyone who owns or controls one or more domestic chicken hens and who sells, offers for sale eggs produced by the animals. There is no size exemption.
2. Provides descriptive terms and minimum requirements for Vermont State egg grades that are fairly identical to the federal standards, set by AMS.
3. Containers must be marked with proper grade and size term.
4. All shell eggs must be graded except eggs of mixed quality being sold by one dealer to another dealer as “ungraded” or “nest run.”
5. Grading must be done by candling.

VAAFAM, however, has issued informal guidance indicating that freshly laid farm eggs may be labeled as “Grade A” and need not be candled. The eggs must be clean and not cracked. See Appendix F for more information.

Appendix 1. CGMP:

FDA proposed to modernize and revise Current Good Manufacturing Processes as part of the FSMA rule making in 2013, at Subpart B. §117.10

The following is a brief summary description of the new proposed CGMPs: -

1. Personnel

- a. Any person with an illness, open lesion, wounds or other abnormal source of microbial contamination of food contact surfaces or packaging must be excluded from those operations likely to result in contamination.
- b. Hygienic practices including wearing of appropriate outer garments; maintaining personal cleanliness; hand washing in an adequate hand washing station before starting work, and at other times when the hands may have become contaminated; removal of all jewelry; maintaining gloves in an intact, safe and clean manner; wearing of hair nets or other effective hair restraints.
- c. Food handlers and supervisors should have appropriate training in food preparation and food protection principals. Supervisory personnel should be assigned the responsibility for ensuring compliance.

2. Plant and Grounds

- a. Equipment must be properly stored, removing litter and waste, and cutting weeds and grass within the immediate vicinity of the plant building.
- b. Adequate drainage around the plant building.
- c. Adequate waste treatment and disposal.
- d. Plant must be suitable in size, construction and design to facilitate maintenance and sanitary operations for food production purposes. Sufficient space for equipment including separation of operations to avoid cross contact and contamination; walls, floors and ceilings constructed in a manner to allow adequate cleaning; drip from condensate from fixtures, ducts and pipes should not contaminate food, food contact surfaces or food packaging materials. Provide adequate lighting with safety type bulbs. Provide adequate ventilation.
- e. Pests must not be allowed in any area of the food plant. Guard or guide dogs are allowed if their presence is not likely to contaminate food, food contact surfaces or food packaging. Insecticides and pesticides must be used in a manner that will protect against contamination with food, food contact surfaces or food packaging materials.
- f. All food contact and non-contact surfaces and equipment must be cleaned as frequently as necessary to protect against cross contact and contamination of food.

3. Sanitary Facilities and Controls

- a. Water supplies must be sufficient. Any water that contacts food, food contact surfaces or food packaging materials must be safe and of sanitary quality. Running water must be provided in all areas where required for the cleaning of equipment, utensils, and food packaging materials or for employee sanitary facilities.

b. Plumbing must be sufficient to supply the plant, to properly convey sewage and liquid disposable waste from the plant. Adequate floor drainage must be provided. Plumbing should prevent back flow from or cross contamination with other systems that carry water for food or food manufacturing.

c. Provide employees with clean toilet and hand washing facilities.

d. Rubbish and offal must be property disposed of.

4. Equipment and Utensils

a. Equipment and adjacent spaces and utensils must be cleanable and well maintained.

b. Use of equipment must preclude adulteration of food with lubricants, fuel, and other contaminants.

c. Food contact surfaces must be corrosion resistant when in contact with food; made of non-toxic materials, and capable of withstanding cleaning compounds and sanitizing agents; seams should be smoothly bonded to minimize accumulation of food particles, dirt, and organic matter.

d. Freezers or cold storage used to store food must have a thermometer.

Processes and Controls

a. Quality control to ensure that food is suitable for human consumption and that food packaging is safe and suitable.

b. Production procedures that do not contribute to cross contamination.

c. Testing where necessary to identify sanitation failures.

d. All contaminated food must be rejected or if permissible, treated or processed to eliminate the contamination.

Warehouses and distribution

Storage and transportation of food must be under conditions that will protect against cross contact and biological, chemical, physical contamination as well as against deterioration of the food and the container.

Appendix B: Food Safety Regulatory Scan Chart

APPENDIX B: Shell Eggs - Food Safety Regulatory Scan Chart						
Agency	Rule Summary	Participating Producers <3,000 hens	Producer Packer <3,000 hens	Producer Packer >3,000 hens	Intra or interstate Commerce	Compliance / Issuance Date
Food and Drug Administration						
Food Drug and Cosmetic Act and the Public Health Service Act						
Rules for the Prevention of Salmonella Enteritidis in Shell Eggs During Production, Storage and Transportation	SE rule for Producers: Imposes preventive measures for the control of Salmonella Enteritidis. Procurement of SE free pullets; Testing of pullet and hen environments; if positive, eggs testing must begin. Biosecurity, pest control measures, cleaning and disinfecting poultry houses and significant recordkeeping requirements.	Exempt	Exempt	Must Register with FDA and comply with rule.	Both	9-Jul-12
	Layers with Outdoor Access: In addition to general SE rules Producers must try to prevent wild birds and other stray animals from entering pasture access areas and monitor and control rodents and flies.	Exempt	Exempt	Must register with FDA and Comply	Both	Proposed Guidance - issued July 2013. Final Guidance has not been published
	Refrigeration rules for storage and transport of shell eggs: To inhibit growth of SE, within 36 hours of lay, eggs must be held at or below 45° ambient temperature during storage and transport. Anyone who stores or transports shell eggs must comply.	Must comply	Must Comply	Must Comply	Both	9-Jul-12
Public Health Service Act						
Refrigeration of Shell Eggs Held for Retail Distribution	Requires retail establishments to refrigerate eggs at 45°; and to permit inspection by FDA.	N/A unless producer operates a retail establishment.	N/A unless producer operates a retail establishment.	N/A unless producer operates a retail establishment.	Both	5-Aug-01
Rules for Food Labeling, Safe Handling Statements, Labeling of Shell Eggs:	Requires that egg cartons include a safe handling instruction on the consumer carton. If packed eggs not for direct consumer sale, statement must appear on invoice.	Must Comply	Must Comply	Must Comply	Both	5-Aug-12
Public Health Security and Bioterrorism Preparedness Act of 2002						
Rules for the Registration of Food Facilities Under the Public Health Security and Bioterrorism Preparedness and Response Act	Requires registration of farms that manufacture or process food; off- farm packing facilities must also register.	Exempt	On farm facilities that pack and hold their own RACs and RACS of others are exempt.	On farm facilities that pack and hold their own RACs and RACS of others are exempt.	Both	12/12/2003 and the September, 2014 Supplemental Proposed Preventive Control Rule.

Agency	Rule Summary	Participating Producers <3,000 hens	Producer Packer <3,000 hens	Producer Packer >3,000 hens	Intra or interstate	Compliance / Issuance Date
Food Safety Modernization Act of 2011						
Growing, Harvesting, Packing and Holding Produce for Human Consumption	Imposes standards for fruit and vegetable producers for the use of Biological Soil Amendments, control of Domesticated and Wild Animals and other measures that could complicate co-production of eggs and fruits and vegetables. 21 C.F.R. §1110 imposes sanitary standards for the production of food for human consumption. Extensive set of standards for buildings and facilities, equipment, production and process controls, warehousing and distribution. Rules were updated when FDA issued rules under FSMA	Tester/Hagan Exemption - See page 14 of Appendix A.	Tester/Hagan Exemption - See page 14 of Appendix A.	Tester/Hagan Exemption See page 14 of Appendix A.	Both	September, 2014 Supplemental Produce Safety Rule made substantial revisions to the Produce Safety Rule.
Current Good Manufacturing Practices		On farm facilities that pack and hold their own RACs and RACS of others are exempt.	On farm facilities that pack and hold their own RACs and RACS of others are exempt.	On farm facilities that pack and hold their own RACs and RACS of others are exempt.	Both	September, 2014 Supplemental Proposed Preventive Control Rule issued by FDA.
Preventive Control Rule	Requires a written food safety plan called a Hazard Analysis and Risk-Based Preventive Control (HARPC) plan for facilities that manufacture food.	Exempt	On farm facilities that pack and hold their own RACs and RACS of others are exempt. Also a qualified exemption for some facilities.	On farm facilities that pack and hold their own RACs and RACS of others are exempt. Also a qualified exemption for some facilities.	Both	September, 2014 Supplemental Proposed Preventive Control Rule issued by FDA.
USDA / Food Safety Inspection Service						
Egg Products Inspection Act						
AMS Regulations Governing the Inspection of Eggs	Applies to Egg Handlers - anyone who sells or buys eggs. Provides for inspection of packing facilities. Plants packing eggs for the ultimate consumer are inspected every quarter. Restricts disposition of restricted eggs. Eggs processed in violation of the Act can be detained or destroyed	Exempt from Registration	Exempt from Registration.	Must Register with USDA as an Egg Handler and maintain records of sales for 2 years. Will be inspected.	Both	Final Rule April 12, 2006
FSIS and FDA Regulations: Refrigeration and Labeling Requirements for Shell Eggs 7 C.F.R. §59	Requires egg handlers including producer packers with a flock greater than 3,000 hens to store and transport shell eggs packed for the ultimate consumer at 45° and label must state that refrigeration is required. "Keep Refrigerated"	Exempt	Exempt	Must Comply	Both	27-Aug-99
Regulations Governing the Voluntary Grading of Shell Eggs	Provides for voluntary licensed inspection of egg processing plants for a fee. Inspected eggs carry a USDA seal. Sets standards for inspected plants including wash water temps.	Grade and weight standards apply - equal to Vermont Standards	Grade and weight standards apply - equal to Vermont Standards	Voluntary	Both	
Vermont Agency of Agriculture, Food and Markets						
Rules and Regulations Relating to the Sale of Eggs in Vermont	Requires that egg cartons be plainly and conspicuously marked with size and quality grades. Prohibits sale of ungraded or mixed size eggs except to dealers. Grading shall be done by candling.	Informal VAAFM Guidance allows producers to sell freshly layered eggs without having to candle the eggs.	Informal VAAFM Guidance allows producers to sell freshly layered eggs as "Grade A" without having to candle the eggs.	Informal VAAFM Guidance allows producers to sell freshly layered eggs as "Grade A" without having to candle the eggs.	Intrastate	Implementing 6 V.S.A. §351 (1973)

Appendix C: Legal Structure – Egg Aggregation Entity

By Annette Higby

In analyzing appropriate legal structures for an Egg Aggregation Entity, a number of factors were considered:

- Ease of formation and operation
- Role of farmer suppliers in management and capital formation
- Capacity to set beneficial pricing for farmer suppliers
- Limited liability for owners
- Should farmers be owners or contractors?
- Capital structure, attracting capital and source of capital
- Profit or non-profit?
- Taxation
- Structures that assist in marketing or contribute to a positive public perception of the product

Benefit Corporation

This type of entity has been authorized in Vermont since July of 2011. 11 V.S.A. §21.01 et. seq. Vermont Creamery, Ben and Jerry's and King Arthur Flour have all converted from a traditional Corporation to a Benefit Corporation. The primary differences between a regular corporation and a benefit corporation are:

- The purposes of the benefit corporation must include creating a general public benefit. The articles of incorporation may also identify one or more specific public benefits.
- Traditional corporate boards and officers will put the interest of their voting shareholders first while the board of a benefit corporation must also consider the interests of their employees, customers, the community, the environment, and their suppliers in making board decisions.
- The general public benefit chosen by the B Corporation must be certified by a third party. Vermont Creamery received its certification from B Lab. B Lab seems to be the primary mover and shaker in the B Corp world, working to pass B Corp statutes in all 50 states. 27 states have authorized B Corps.

One director of the B Corp must be designated as a Public Benefit Director who is responsible for creating an Annual Benefit Report to assess the corporation's social and environmental performance. The benefit director must be independent – meaning he or she has no financial interest in the B Corp.

The B Lab certification process includes an assessment of governance, labor, environmental and civic practices and policies. An impact assessment tool can be found here: <http://bimpactassessment.net> To be certified, the Corp must score a minimum of 80 out of 200 points.

All the other rules applicable to traditional corporations in Vermont apply to a B Corporation. You can choose S Corp status to be taxed like a partnership, for example. Shareholders have limited liability meaning they cannot be held personally liable for the debts or liabilities of the B Corp. Directors and officers also have limited liability.

A B Corporation would provide a favorable profit making legal structure for the aggregator. A B Corp structure would permit you to provide a favorable pricing structure for participating farmers and to otherwise manage the business in a way that promoted sustainable farming practices. Rather than simply focusing on the best possible return to shareholders, you could ensure benefits would also flow to farmer suppliers. The farming practices required of the suppliers would help ensure certification. You could also contribute a portion of the production to Vermont food banks. It's an entity that could also attract socially motivated investors and in fact may be the best structure for raising non-farm capital.

Unlike cooperative taxation, for example, the rules of S Corporation taxation are well understood by Vermont accountants. Vermont consumers are not necessarily aware of B Corps, however. Marketing materials would have to educate consumers about its meaning.

B Corps look to be easy to form. Along with Articles of Incorporation, you would also need to develop bylaws to govern meetings, define a quorum, board and officer responsibilities, etc. If fewer than 25 shareholders you could also choose to be a closely held corporation allowing you to dispense with bylaws and a board, but both are still advisable. Governance is best when it is transparent, when the rules and roles of the board and management are clear and in writing.

You could also develop a shareholder agreement that would allow interested participating farmers to buy equity in the entity over time, provide preferred treatment for initial investors, or other measures to attract investor and farmer capital. The B Corp could also sell feed, cartons and other inputs at a discount to suppliers and sponsor educational forums on pasture based egg production.

Cooperative

A cooperative is a profit making entity owned by its members. The cooperative exists to serve its members by providing goods or services at cost. Because cooperatives are to operate at cost and return profits to member owners, Vermont statutes literally refer to them as non-profit corporations.

The Cooperative must have a board to oversee management of the co-op. Members of the co-op elect the board and each member has one vote. Some co-ops allow a board to make most of the major decisions. Others require that all major decisions have to be voted on by members. The co-op members and board all have limited liability.

The bulk of the initial capital for a cooperative for start-up and first year operations must come from members of the co-op. The difficulty of raising capital from farmer members is probably the biggest obstacle to co-op formation. Debt financing, however, is also available. Farmer co-ops are also eligible for many USDA grant programs that support the expansion of local and regional food markets. Some co-ops issue preferred stock to raise additional capital. The preferred stockholders do not have a vote, but may be promised a guaranteed return and in the event of liquidation, they ordinarily get paid a liquidation distribution ahead of members.

Lenders will usually look to co-op members to come up with 30 to 40% of the start up and first year operating capital. The Cooperative Fund of New England may be able to provide financing with a smaller equity but would need collateral. FSA can also make loans to cooperatives.

Net profits of the cooperative can be allocated to:

- Patronage refunds to members. This portion of profit is returned to members in proportion to their use of the co-op. If a member accounts for 10% of all eggs marketed through the co-op, that member would receive 10% of the profits allocated to patronage refunds.
- Equity capital to be reinvested in the co-op (taxable to the co-op.)

In some cases, a portion of the patronage refunds will be retained by the co-op but be taxed to the member, which can be a significant tax advantage to the co-op. The portion of patronage taxable to the member is allocated to a member's capital account. Bylaws will determine whether and when a member can withdraw capital. Co-op membership is rarely a good long-term investment, however. The co-op exists to provide a service at cost to its members, rather than to provide long-term capital appreciation.

The Board will determine the portions of net profit to be allocated to members or to retained equity capital. This is how co-op members continue to provide capital to the co-op.

The second obstacle to co-op formation may be getting farmers already very busy with their own farming operations to participate and contribute to the governance of another entity. It would require a core group of farmers with enough drive and vision to get from the initial co-op organizing board to an operating cooperative. Cooperatives are sometimes created by non-profit or institutional entities and are then turned over to the members, however, and sometimes they succeed. However they are formed, strong farmer leadership, profitability and solid value received by members are the key ingredients to success.

Services provided by the cooperative could include everything from washing, grading, marketing and distribution to providing technical assistance on pasture based egg production. It could also include bulk purchase of feed, egg cartons, and other inputs. Services could start with just marketing and distribution and expand. The Organic Valley Cooperative, for example, began by providing marketing and distribution for vegetable producers in Minnesota.

Like a Benefit Corporation, being a cooperative would provide a positive marketing advantage. Even though most people don't really understand how co-ops work, they do have a positive public perception. Consumers want to support "farmer owned" and "farmer controlled" entities. And a farmer owned entity would ensure a greater share of the consumer dollar ended up in the hands of farmers.

Governance in a co-op is very different than in other profit-based entities. In a Corporation, Partnership or LLC, management rights are ordinarily determined on the basis of capital share. If you own 51% of the capital, you vote 51% of the shares. In a co-op, each member has one vote regardless of his or her capital account or the amount of business done with the co-op. Some co-ops also try to make decisions by consensus rather than by majority vote. So, meetings can be very, very long. Some think that having to satisfy the concerns of most, if not all, members contributes to the longevity of the entity as well as conservative management as big changes will require a significant number of members to agree.

Forming a cooperative is similar to forming a corporation. Articles of Incorporation are filed with the Secretary of State. Bylaws must then be finalized. You must have at least five initial members. Members must be engaged in the production of agricultural products (unless formed under the general corporation statute). Similar to a B Corp, you can nominate one board member to represent the interests of the public who need not be a member. These are all last steps, however, following feasibility analysis and recruitment of initial members.

Limited Liability Company

An LLC is another potential profit making entity. One farmer producer or a group of producers would own the LLC. The LLC would market and distribute eggs of the owners and the eggs of other farmers under contract to the LLC. The farmer owners would bear the financial risk of the enterprise and would have to raise all the capital. As a limited liability entity, his or her financial exposure would be limited to the capital in the LLC. Personal assets would not be at risk.

This is similar to the Pete and Jerry's model. It is also the Perdue model. Both provide chicks, feed, vaccinations, replacements, supplements, transport and packaging and they both retain ownership of the birds. Both dictate housing, bio-security and other practices.

An Egg Aggregator LLC could be structured quite differently. Farmers could retain ownership of their own flocks and source their own feed but follow the best management practices required of the LLC. The activities of the LLC could be limited to marketing and distribution. There is no particular marketing advantage associated with being an LLC. There is a negative public perception of contract farming, however. The farming practices and local sourcing would have to be enough to sell the eggs to consumers at a premium.

As a traditional profit making entity, management control would flow to those with the biggest capital at stake in the business represented by numbers of voting units (rather than shares.) There is no need for a board or an annual meeting. Rights of LLC members are set out in an operating agreement. Profits of the LLC would flow through to the members in proportion to their ownership stake. LLCs can choose to be taxed as a partnership or a corporation. Partnership taxation, which taxes income to the members and not at the LLC level, would avoid double taxation.

The LLC structure could provide for farmer investment in the entity over time but it is unlikely they would be able to achieve enough of a stake to control management. It would not be a good investment.

Non-Profit

There is one primary reason why a non-profit entity is not a good choice for the egg aggregator. The IRS has rules against private benefit – the notion that a non-profit must be organized and operated exclusively for religious, charitable or scientific purposes. To meet this test, it must serve a public rather than a private interest. If there is a substantial private benefit, tax-exempt status is denied or withdrawn. A non-profit engaged in commerce for the benefit of farmers looks like a private benefit. Farmers could not be involved in pricing decisions. The board would have to be completely independent and financially disinterested.

Appendix D: Selling eggs in New England (and Pennsylvania)

By Annette Higby

Connecticut

Statute

Conn. Gen. Stat. 22-40, et seq.

All shell eggs sold must be labeled with grade and size designation, sold, transported, and refrigerated in compliance with FDA and USDA rules.

To be sold, shell eggs must meet at least one consumer grade as established by USDA/AMS as determined by candling. USDA standards for sizing of eggs are to be used for shell eggs sold in CT. Advertising and label must include grade and size, if sold wholesale, invoice must include grade and size. May not use the term “fresh” or similar descriptor unless it meets Grade A standard.

Producers selling direct to consumers or to a first receiver who will grade them for size and grade prior to resale are exempt.

Rules

Connecticut has implemented a voluntary small egg processing plant inspection program for small egg producers with more than 200 but fewer than 3,000 hens. It’s a very strict egg surveillance program comparable to federal inspection of egg handlers under the Egg Products Inspection Act. Eggs produced, graded and labeled in accordance with the program guidelines are designated as an “approved” food source. They also have a voluntary SE prevention program.

Maine

Statute

7 M.R.S. §631-643.

Size standards and grades must not be lower than USDA/AMS standards. Maine Department of Ag has adopted USDA/AMS standards. Grading must be done by candling.

All eggs sold shall be advertised and labeled with the grade and size designation of Maine consumer grades – unless exempt. Shall appear in clearly legible letters on the container or if sold wholesale, accompanied by an invoice stating both size and grade designation.

Only eggs that meet the Maine Grade A standards can be labeled as “fresh eggs,” “strictly fresh eggs,” “quality certified eggs,” “nearby eggs,” “native eggs,” or similar descriptors.

Only producers selling direct to consumers are exempt from the grading, labeling, and candling rules.

Producers shipping to a wholesaler needn’t label or grade, but if they do mark for grade and size, the labeling must be accurate and in compliance with Maine grading standards.

Rules

The final determination of grades must be made by candling.

Eggs offered for retail must be labeled with name of person who packed them, include safe handling instructions and the grade of the egg. Eggs for retail sale must meet a minimum Grade B unless they are sold from the farm. Grade B eggs need not be candled. If the eggs are not candled they should be labeled Grade B. Fresh eggs may not be more than 30 days old.

Massachusetts

Statute

May not sell eggs as “fresh” unless they meet statutory requirements as determined by candling. May not sell unless carton or container includes a proper description of one of six allowable sizes determined by weight. Cartons or containers of un-sized or mixed sizes may be marketed as “not sized.” Eggs may also be sold as “not graded.” If ungraded, they may not be labeled as “fresh.”

Rules

Manual for backyard producers provides: Clean eggs do not need to be washed. Collected eggs must be refrigerated. Packaging must have safe handling instructions and include the producer’s name and phone number. Eggs may be sold as “Ungraded and Not Sized.”

New Hampshire

Statute NHRS §428.22

May not sell as “fresh” unless meet standards of NH Dept of Ag, as determined by candling. Standards for package markings as to size delegated to Commission or Ag.

Rules

<http://www.agriculture.nh.gov/publications-forms/documents/shell-egg-guidelines.pdf>

NH has adopted USDA/AMS grading standards – egg cartons must be marked as to grade but eggs do not have to be candled although candling is recommended. Label must include weight class or be labeled as “Not Sized.” Eggs should be washed or cleaned. If not washed, eggs may be wiped with a clean cloth or abrasive type material. Cartons must include name of producer or packer. Eggs must be refrigerated.

Pennsylvania

Statute

Unlawful to sell eggs as “fresh” unless they meet standards as established by PA Department of Agriculture. Quality to be established by candling or by other approved methods prescribed by PA Department of Agriculture.

Rules

A producer with a flock of less than 3,200 laying hens and sells their eggs within 5 days of lay and sells eggs predominantly within a 100 mile radius of the farm or processing facility the following rules apply:

- Eggs must be maintained at 60 degrees F or less from the time of gathering to the time of sale. This also applies to eggs sold at farmers markets or at roadside stands. (Conflicts with FDA rules.)
- Each carton, flat, or container of eggs must be labeled with the following information:
 - Name and address of producer
 - Date of lay
 - Statement of identity (eggs)
 - Net Contents (in 3/16 inch high letters)
 - "Keep Refrigerated" along with egg handling instructions

If the eggs have not been weighed or are of mixed sizes and are not graded they must be labeled as “unclassified.” They may not include dirties, leakers or loss eggs. If a grade does appear it must be accurate.

Rhode Island

Statute

R.I. Gen. Laws § 21-17-1, et. seq.

All shell eggs sold for human consumption must be labeled as to size and grade using standards established by RI Department of Agriculture. Advertisement and invoices must also indicate size and grade. Must be grade A to be labeled as “fresh.” Producers selling direct to a first receiver who will grade and weigh are exempt from labeling requirements.

Rules

All eggs sold, even if direct to consumer, must include the exact grade and size on the container.

Appendix E: A Reminder About Selling Eggs

(As found in October 24, 2014 Vermont Agriview)

Many people in Vermont with home flocks of chickens sell their excess eggs, either at home, a farmers market or in a retail store. In order to legally sell the eggs, the following requirements must be followed:

Cartons – It is legal to use either new, stock cartons or used cartons to sell eggs. If you choose to sell in used egg cartons, cross out any code date or USDA Shield on the carton.

Size – If the home producer uses large or extra large cartons, they should not have to weigh the eggs, as most home produced eggs will meet these weight requirements. The exception would be bantam birds that produce much smaller eggs.

Grade – All cartons must state “Grade A”. Home produced eggs will meet this standard, as Grade A eggs have a fairly small air cell, a reasonably firm white, and a yolk that moves slowly within the shell. By Vermont law, ungraded eggs can only be sold between egg dealers, and are not allowed on retail sale. Producers can candle their eggs, but are safe to grade them as Grade A, even if they do not candle them.

Condition – Eggs must be clean and unbroken.

Identification – There are several ways to mark the producer information for eggs. A return address mailing label can be affixed to the carton, a name and address can be written on the carton, or a 3x5 card with the name and address can be put in front of a display of eggs.

If you have any questions about the sale of eggs in Vermont, contact Henry Marckres at 828-3458 or henry.marckres@state.vt.us

Appendix F: Poultry Budget Assumptions

Sample budgets are based on a hypothetical farm operation. Expenses are calculated based on Best Management Practice Recommendations and actual market rates for goods and services. Each farmer should conduct their own financial analysis before beginning a new enterprise.

Example farm has a mortgage of \$250,000 for 30 years at 3.5%. This would mean the farm had a purchase price of \$300,000. This farm would have some structures that could be repurposed/renovated for use in the egg enterprise. It would also include a farm house for the farmer and family.

Both the 1,000 and 3,000 layer budgets assume that a portion of the mortgage and farm overhead expense. The 1,000 bird enterprise would assume 25% of these expenses and the 3,000 bird enterprise would assume 50% of them. In each of their instances the rest of the farm overhead would be covered by a combination of other enterprises or off-farm income.

Labor is based on an hourly rate of \$15, which *includes* all associated payroll expenses. The labor calculations are for all labor required, so if the labor is performed by the farmer this expense will be recognized as income for the farmer.

All budgets assume a line of credit to purchase pullets and feed. These loans assume a 7% interest rate with the principle being paid back in full within 12 months.

Auto/distribution expense is based on a set per mile expense. This will vary based on the type of distribution and distance to markets of the actual farm.

Each budget assumes that the enterprise start-up expenses will be covered by an operating loan with a 7 year term and 5% interest rate.

Appendix G: Feeding Food Scraps to Laying Hens

By Tom Gilbert

Description of the Practice

Systems to feed laying hens food scraps in commercial operations are still evolving. Generally, a farm's set up reflects the scale of the operation and the role of food scraps in the feed ration.

Feeding

Some operators feed their hens exclusively on food scraps, compost, and pasture with mineral supplements, while others offset a portion (5-50%) of their purchased feed with food scraps. In Vermont, when this practice is occurring with flocks over 40 birds, the food scraps are typically imported from surrounding communities.

Experience from two laying operations where food scraps and compost are 100% of the feed ration suggests that providing 2 pounds of food scraps per day works well. It appears hens will eat up to 1.5 pounds of food scraps daily, however not all of the food scraps provided will be desirable or edible to the hens. Therefore, modestly over-budgeting the food scrap amounts is advisable and supports the hens' ability to fill themselves while using discretion about what they choose to eat.

Sourcing Food Scraps

Typically food scraps are captured from grocers, restaurants, schools and colleges, hospitals, residents (through drop off programs at recycling centers), prisons, corporate and state cafeterias, resorts, food processors, brewers, distillers, and other food-based businesses and institutions. Collection systems range in scale and mechanization. Some farms do not haul food scraps and receive loads from commercial or municipal haulers, while others self-collect using methods including small containers (5-32-gal) in the back of a pick up truck, medium size containers (32-48 gal) on a flatbed trailer, or larger containers (48-64 gal) with mechanical systems for tipping containers into a dump trailer or truck. Where small and medium sized containers are collected and food scraps are transported in the container, operators exchange clean containers (requiring extra containers) for full ones, while operators tipping containers into a truck or trailer carry onboard washing systems and clean containers on-site once they have been tipped. These systems carry their own water and collect wash water in with the food scraps.

Handling and Feeding Food Scraps

Handling and feeding food scraps requires good infrastructure and husbandry. Like other aspects of one's farm operation, the handling and feeding food scraps system must work reliably and every day. Therefore the parts of the system need to function under all potential circumstances. For example, predictable access to the tipping location throughout the year is critical. Useful features of food scrap feeding infrastructure include:

1. Access Road(s) – Stable road surfaces and plenty of turning radius.
2. Tipping Dock - In most cases the operator will benefit from having an elevated platform for tipping loads into a receiving or feeding bin.
3. Feeding System – This is an organized, contained and manageable system to feed materials with adequate access for tipping loads, blending materials, and removing contents. These systems can be mobile or static and can be designed to support feeding food scraps alone or in a compost blend. A Feeding Bin can be useful in giving hens contained access while providing equipment with a place to blend materials and push walls for easy removal. Covering the feeding area will increase hen foraging in inclement weather, keep mix drier, and prevent snow from accumulating on the food scraps.
4. Compost Management System – Under most scenarios there will be residual food scraps that the hens don't eat. If the food scraps have not already been blended with a carbon material to support composting, the residuals will need to be combined with dry matter and carbon. Either way this system will result in a combination of uneaten food and other organic materials requiring management. The operator will need a place sufficiently large and easily accessible to actively manage this composting process. This can be within or outside of the feeding system.

The primary and obvious difference in handling food scraps as opposed to grain is the moisture content and putridity of the food scraps. As a result of this high moisture 'ready-to-rot' condition, food scraps have the potential to cause odors, create environmental pollutants, attract rodents, skunks and other unwanted critters, and potentially, create poor animal health conditions. Additionally, the moisture content of food scraps make them prone to freezing in cold temperatures, making the food unavailable to hens for eating.

By integrating the feeding of food scraps into a composting strategy the operator can mitigate these concerns while also gaining other benefits. The composting process requires blending the food scraps with other organic materials, of which a good portion must be dry carbon material to support active composting. This requires that the operator secure these other materials proportionately to the amount of food scraps they anticipate handling. When these materials are blended they create the conditions to support exponential growth in the beneficial microbial population, especially bacteria. This process mitigates odor creation,

leachate, colonization by pathogenic organisms, and produces heat that keeps the materials from freezing. In some cases the feeding pile remains free of snow. Additionally, there is reason to believe that by culturing microbes in the food scraps we can increase the protein available to the hens and gain other health benefits associated with grazing birds. In order to support these conditions, the handling system must lend itself to passive pile aeration, blending and rolling, and operator management.

Economic Benefits

As noted earlier, one of the clearest benefits of feeding food scraps to laying hens is reduced feed costs. The range of savings on feed depends on whether the grain is bulk or retail, conventional or organic. Another economic benefit is potential new revenue from tipping fees (a fee paid to the farmer by the hauler who delivers the food scraps). In scenarios where producers receive a tipping fee for accepting food scraps, the operator is able to turn feed from a large cost to a modest income. In addition, like pastured or organic eggs, there may be a marketing opportunity for eggs produced by a method that uses of a locally available resource – food scraps – instead of imported feed. Additionally, if current and future research reveals nutritional attributes of the eggs similar to pasture raised layers, the health benefits will become a strength in creating additional value.

Labor

The trade off from reduced feed costs with this system is higher and different labor costs. Adequate scale and facility development can reduce labor demands significantly, though initial capital costs will increase. Mechanizing the tote handling and washing system provides dramatic reductions in labor costs per ton of food scraps handled. Covered feeding areas with adequate space for managing several weeks of food scraps in one place will reduce snow management and materials movement (food scraps, and especially food scraps blended into a compost mix will reduce in volume over time).

Pathogens

While farmers have been feeding food scraps to laying hens for hundreds, if not thousands, of years, the resurgence of this practice for commercial flocks has raised issues about potential pathogen pathways. Current research (scheduled for release in late 2015) has narrowed down that concern, with *Salmonella* *Enteritidis* the pathogen of most concern. The concern is that *s. Enteritidis* could be brought into the laying operation and hen exposure in feed could result in the vertical transmission into eggs. From the testing already conducted on three farms (including one not following best practices) researchers have not identified elevated levels of pathogens.

To mitigate pathogen concerns, feeding food scraps in a composting system enables the producer to grow out a dynamic bacterial and fungal food web that will prevent bacteria of concern from reaching pathogenic levels (due to resource competition for the most part). While questions remain about how to best manage this integration and optimize pathogen management, adequate literature exists to substantiate the efficacy of

composting systems in destroying and managing pathogen colonies. Since hens are benefiting from this microbial diversity and abundance year round, there may in turn be animal health benefits we do not yet fully understand.

Advancing the Practice

A Northeast Sustainable Agriculture, Research and Education (NE SARE) grant is currently supporting a collaborative research project between Black Dirt Farm (Stannard, VT), Cornell University, University of Connecticut and two participating farms in central and northern Vermont to further assess aspects of this practice as discussed here. Further research and documentation is needed to advance this practice, and fully leverage the opportunity presented by State legislation banning discarded food from the landfill.

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